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Students' Designs at the Institute.

WE have seen better collections of designs for the Soane Medallion than those of this year; but the subject of "A Casino on the Borders of a Lake" is not one calculated to bring out the best powers of young architects. The very word "Casino" seems to suggest a building of a florid character, on which the highest quality of architectural design would be thrown away, or even out of keeping with the destination of the building. The provision that the building, to be 300 ft. by 200 on plan, was to be placed on a site of 1,000 by 500 ft., to be laid out in gardens, added however an element of interest to the scheme.

The design by Mr. Anthony R. Barker, to which the prize has been awarded, is an exceedingly free classic, the drum of the dome being decorated with windows filled in with small tracery in a rather Byzantine manner. The plan of the building is a square with a large oval apartment at each angle (Club-room, Salon, and two Cafés) roofed with a low dome which is not important in the composition. In the centre is the large concert-room, square at one end on plan and horseshoe on the other, but covered above with the dome, of the line of which there is not the slightest indication on the ground plan. To our thinking the relation of plan and exterior design is so important an element in architecture that it is rather a pity that a design which at once strikes one as defective in this respect should be selected for the prize. It is no secret that the design signed with a kind of fylfot mark is by the same competitor—indeed, the similar execution of the two coloured perspectives bewrayeth it; and the latter is the better design, though it must be admitted that the plan, as a plan, is more commonplace. The plan of the selected design is a fine conception. Both designs fulfil the architectural idea of a Casino, but the use of a monster die as a finial, however symbolical of some of the amusements of a Casino, is a vulgarity in design. We must compliment the author on the ability and the perception of colour shown in his two water-colour perspectives, though he has not studied the facts of reflection in water sufficiently; considering how far back the building is from the water's edge, the reflections as he has shown them are impossible. We may recommend to his notice an article on the subject in our issue of July 23, 1904.

A second prize of 21*l.* has been awarded to Mr. Adrian Berrington for his design. The plan of the building wants unity of conception; it is more like two or three plans tacked together; but he has treated his concert-room well, with a colonnaded apse at one end and a grand staircase separated from it by a loggia at the other end. The best part of the design is the laying out of the ground in front of the Casino, with a large avenue on elliptical plan abutting on the lake shore at each end, and running past the front entrance of the Casino. Within this is another terrace semicircular on plan, and near its lake ends are two circular bays of water each with a sculpture group in the centre, and enclosed with pilastered and balustraded walls the upper termination of which is on a raking curve rising to a higher level. There is so much agreeable play of line in these features of the lay out of the ground that the building seems rather too severe and straightlined to harmonise with them. The square white blocks of masonry standing above the slope of the red-tiled roof look awkward and unmeaning (it is curious, by the way, what a tendency to red-tiled roofs there is in this competition). There is nothing in the plan to suggest why there should be a tower or lantern near one end of the roof and none in the corresponding situation. Where there is an emphasis of that kind above, there should be some corresponding emphasis in the plan to suggest a reason for it.

Of the other designs "Pan" certainly answers to his motto in an endeavour to cram together in one perspective view every imaginable architectural feature connected with classic architecture, resulting in an extraordinary medley; but this is obviously a very young design. "Nikisch" is a classic design of considerable merit; less like a Casino than the rest on account of its severity, but creditable to its author, though we do not like coupled columns so wide apart as he puts them. His concert-room is a Greek cross with the centre covered by a dome which, as it directly expresses the plan, might suitably have been made a little more prominent in the external design.

"Gee Ess Ae" shows a commonplace plan with the feature of two large interior garden squares within the lines of building; the elevation is good in the main, but rather spoiled by the heavy and somewhat coarser treatment of the dome in the centre. He has an idea in the lay out of the ground, with the large avenues on a curved plan at each end. "Two and One," rather in French château style, shows also some good laying out, and his idea of a large artificial "Pool" in front of the Casino, shut off from the lake with piers forming terraces, is not a bad one. "Conchitic" is an eccentric but certainly clever design, which from the treatment of the section we should imagine to be by a half-fledged Ecole des Beaux-Arts student. It is hardly architecture at all, in a scholastic sense, but it is clever fantasy, and has at all events the merit that no

one could possibly take it for anything else than a Casino.

The subject for the Tite prize—a covered arcade of shops, 200 ft. long, leading from one street to another—was not a very exciting one either, but it has evolved a very good competition, and the design by Mr. R. W. M. Gunn, to which the prize has been awarded, is one of the best sets of drawings we have ever seen in these competitions. The planning of the shops, with a recess between each which forms a porch of entry to a door on each side, is very well arranged for combining convenience with architectural effect; the detail elevation and the pencil perspective of the arcade are beautiful drawings. The street elevation shows a classic front with an arched entrance below and an order above, with some of the little eccentricities of recent classic developments; it is not remarkable; but the design of the arcade is excellent.

A second prize of 15 guineas is awarded to Mr. B. E. Lisle for his design, in which the street front, somewhat heavy, is nevertheless better on the whole than that of the prize design; but the planning of the arcade shops is very inferior, and the architectural treatment commonplace but correct. A third prize of 10 guineas is awarded to Mr. S. Herbert Maw, which he has obtained we imagine chiefly in virtue of his very fine coloured perspective drawing of the circular hall and cupola which forms a central feature in his arcade. This feature itself, however, is rather a mistake; an arcade connecting two streets should have the air of being a connecting passage, and we should not be stopped, as it were, in the middle by an interrupting feature, unless the arcade were of much greater length than this.

Among the other designs, "Palladio" gets a bold effect with a lofty arch running through three stories, and an open colonnade over it connecting the street blocks on each side; but we rather think his three-story arch, which implies an arcade of the same height, is contrary to the instructions, which limit the Arcade to two stories in height. "Rodin" breaks his Arcade in the centre by two large semicircular niches which, besides the objection we have before made to interrupting the Arcade in the centre, take up space which would be more usefully occupied by shops. His detail elevation is boldly and effectively drawn and coloured. "Spurs" shows an effective plan in three square compartments with domical lights, divided by small blocks containing staircases to an upper story. "Wren" has a well-sketched pencil perspective. The Tite designs, as a whole, are a highly creditable set.

The subject set for the Grissell Prize, a design for a landing-stage to form the principal approach to a royal palace, offered a wide field for the display of architectural imagination. The set of drawings for which the prize was awarded, the work of Mr. Douglas W. Day, were undoubtedly the best submitted, with the possible exception of those sent in under the pseudonym of "Christopher Gubbins." Though the drawings were required to be "all to the scale of $\frac{1}{4}$ in. to the foot," Mr. Day has allowed his fancy 32 ft. to the inch in a plan showing the general lay-out of the surroundings. It is open to question whether this was quite legitimate; the landing-stage alone was to be the principal approach to this palace in the clouds; here are shown almost interminable lengths of colonnade composing land approaches of at least as great importance as the waterside approach; a scheme of great ability and imagination, but beside the point. The stipulated reception pavilion "30 ft. square, with a stone roof," is covered by an inner and outer dome, the capabilities of which last to carry the stone lantern by which it is surmounted we seriously doubt. Lavatory accommodation, which was not asked for, is thoughtfully supplied; in fact, no fewer than five basins are provided to wash the royal hands in. The order surrounding the drum of the dome is a little unhappy, detracting as it does from the aspiring character which its height would otherwise have given it. On the whole it is a good and dignified design, on orthodox lines; as we have suggested, a great deal more is given than was asked for; the landing-stage, however, and its appurtenances *per se* render it worthy of the award which it has gained for its author. "Christopher Gubbins" certainly displays greater originality in his elevations, which have a Byzantine tendency. The loggia in front of his reception-pavilion has a happy effect. The terms of the conditions are adhered to strictly, and no more is given than was required. In point of draughtsmanship, this set is perhaps superior to those which have been awarded the prize. The other drawings submitted come a long way after those which we have just mentioned. The scheme of the author who conceals his identity under the device of a scarab possesses considerable merits on plan, but the elevations are by no means of a corresponding excellence. "Isis" submits a very fair set of drawings. "Architectus" apparently has large ideas, and his design has some very good points, but his style of draughtsmanship and imperfect appreciation of architectural fitness put him altogether out of court. He can surely see for himself that the projection of a semicircular arch at an angle of 45° to the plane of vision is not solved by transforming it into a pointed arch.

The Pugin Studentship has fallen this year to Mr. Sydney H. Miller. Remarkable truth and delicacy of execution is exemplified in his measured drawing of the sedilia from Hawton Church, Lincolnshire. The perspective sketch of the Lichfield chapel in St. Lawrence Church, Evesham, is very good indeed. Other drawings of conspicuous excellence are those of the Chapterhouse door at Southwell, details from the nave of Pershore Abbey, of the brass lectern at Cropredy Church, and of glass from Fairford. It is an award about which there can be no question. Mr. H. Hubert Fraser has received honourable mention for a fine set of drawings; we do not altogether like his perspective view of the tower of Heckington Church, which strikes us as rather out of drawing in places. The details of the Easter Sepulchre at Hawton are admirable in truth and appreciation of the spirit of mediæval sculpture. Of equal if not of superior excellence are the drawings signed "L. B." of the Bell Harry tower at Canterbury. The same author's small-scale drawings of Warmington Church are very attractive, giving evidence of high powers of draughtsmanship. These three sets are undeniably superior to any others submitted, of which two deserve special notice, those of Messrs. A. D. Robinson and A. G. Blackford. The latter gentleman's sketches are perhaps rather too mannered; Mr. Robinson's show great promise, though somewhat more pictorial than such sketches should be. We confess to the feeling that the inclusion of Renaissance work in the drawings submitted for the Pugin Studentship, a practice which seems on the increase, would not have been relished by its founder. Such examples are in evidence in one or two sets.

The Owen Jones Studentship has not been awarded this year. Mr. S. Herbert Maw, the only candidate, who also, as we have noticed above, gained an award of 10*l.* in connexion with the Tite Prize, has been given a certificate and 21*l.* The labour entailed by competing in the same year for two such important prizes may explain why his work was not quite up to the required standard.

Mr. Leslie Wilkinson, again the sole candidate, has gained the Arthur Cates Prize. His drawings comprise some excellent work, notably a good sketch of the west doorway of Magdalen Chapel, and another of the west porch of S. Trophime at Arles.

The Measured Drawings Medal has been gained by Mr. Ernest W. Wray for a set of drawings of Sangallo's Church of the Madonna di San Biago at Montepulciano. They are a thorough, well-worked-out set; the draughtsmanship is beyond criticism. In beauty and delicacy of execution it would be hard to surpass the drawings of Lavenham Church by Mr. Alan G. Brace, who has received honourable mention. "Esse quam videri" has justified his motto in his drawings of Emmanuel College, Cambridge. The perspective view shows very high artistic qualities. Under the motto "Antiquis debetur reverentia" are some good drawings of the Royal Infirmary, Glasgow, and of other work of Robert Adam in the same city. "Metopemania" is the author of an excellent set representing portion of Greenwich Hospital. The construction of the domes is very thoroughly gone into. The wheel of Fashion has performed a complete revolution since the days of the Gothic Revival. Forty years ago it would hardly have been deemed possible that drawings of St. Pancras Church would ever be submitted for the Institute Measured Drawings prize. It is an open question whether "Erectheum" would not have profited more by measuring with infinitely less trouble the fragments of the original at the British Museum, than by an actual survey of the Inwoods' terra-cotta facsimiles; yet we must confess to a secret feeling of satisfaction that the influence of the much-maligned Greek Revival has survived the taunts and insults of a hot-headed and illogical Gothicism. The drawings are highly finished in the thin line proper to the period, and make a set of great interest,

"Cistercian's" drawings of Fountains Abbey give evidence of great industry, if the draughtsmanship be not of a very high quality. Horham Hall, Thaxted, is represented by a set of drawings of great merit, under the motto "Persis'e." On the whole, the measured drawings of this year maintain a fairly high standard, with one or two exceptions.

NOTES.

Rates of Wages *v.* Labour Disputes.

In view of the statements set out by the Labour Party in a Memorandum preliminary to the Conference on Unemployment to be held at Portsmouth on January 27 as to the decrease in wages, we commend to our readers' notice an article in the Board of Trade *Labour Gazette* for this month, in which Employment, Wages Disputes, and Prices in 1908 are reviewed. In the first place, it is to be remarked that disputes very seriously affected employment, and since the year 1898 no such number of working days has been lost owing to this cause; the aggregate duration of all disputes in working days being 10,783,000, as compared with 2,162,151 working days last year. This cause of unemployment, we may point out, is not due to bad trade, but conduces to bad trade and permanently drives work out of the country. In the Memorandum the changes in rates of wages were set out, with the result that it appeared whilst capital was increasing wages were decreasing. It may therefore be well to observe that it is especially stated in the official returns that the changes taken into account in the returns are only changes in rates of wages and not fluctuations in the total amount of wages paid due to variations in the amount of employment available, or altered conditions of employment or increments automatically accruing under scales of pay; but even then over a period of thirteen years, 1896-1908, the aggregate of the net increases exceeds that of the net decreases by 396,768*l.* a week. These are facts to be borne in mind in view of the statements in the Memorandum of the Labour Party, statements likely to be repeated and amplified at the forthcoming Conference on Unemployment.

Afforestation.

In the Report of the Royal Commission, to which was delegated the important duty of inquiring into the practicability and desirability of national afforestation in connexion with reclaimed lands or otherwise, we have a welcome expression of opinion that the expenditure of money on the systematic cultivation of trees in the United Kingdom would be a sound investment. That is the view we have consistently advocated for several years past, and it is one which is fully supported by the experience of various continental and other countries. The Commission at present estimate the area of land available for remunerative operations at nearly 9,000,000 acres. We are inclined to think that this figure might be increased, but a national forest of 9,000,000 acres would be a very good start, and our hope is that the project may commend itself to the Government and every member of the Legislature. The matter is in no way one for party considerations; the scheme foreshadowed by the Commission deserves full support from all classes of the community, and particularly from those who desire to reduce the lack of employment now so prevalent and to encourage the flow of unnecessary labour in towns back to the land.

Ancient Monuments in Wales.

From the newspaper reports of the sitting of the Commission on Ancient Monuments in Wales and Monmouthshire it would seem that it is high time that steps were taken to protect such monuments from demolition or injury. Mr. George Evans, of Aberystwith, said that though many old castles in Wales were now carefully preserved, there were still some that were used as henroosts, and that last summer a cromlech stone on Pendaon Head was blown up with dynamite by some person unknown. Many XVIIIth century churches in Wales, he said, possessed some relic in the shape of a pew, a font, or an altar, preserved from an older church. It is important that things of this kind should be catalogued and properly looked after, or they may disappear unawares, and the discovery be made too late.

The Extension at the Law Courts.

We understand that it is proposed, when the extension of the Law Courts is completed, that the Strand end shall be occupied by the Probate and Divorce Court and the Admiralty Court; the northern end by a Chancery Court and a spare court, the chief use of which will be as the Court of Criminal Appeal. There will then be two courts, now occupied by the Probate, Divorce, and Admiralty Division, available for use by the King's Bench Division, and the temporary court in the east courtyard will, of course, be abolished. It will be interesting to see whether these new courts will be in advance of those in the main block, in regard to ventilation, warmth, and the public convenience, or whether no lessons have been learnt during the years which have intervened since Street's courts were erected, in which, by the way, the new staircase from the Central Hall to the west corridor of the courts is now completed and in use.

The Thames Embankment.

Since the construction of the double track tramway-lines close to the south pavement of the Thames Embankment a remarkable development has taken place in motor traffic along that highway. Consequently the public have good reason to thank the London County Council for placing additional refuges in the roadway. We quite agree with the views put forward to the effect that obstructions of the kind are unscientific and tend to impair the usefulness of an important highway. But the main fact is that the narrow refuges erected alongside the tramway-track have proved exceedingly useful, and that the temporary structures on the northern side of the tramway have also been much appreciated by pedestrians. From personal experience we are able to realise the dangers of the Embankment even for persons of agile habits and presence of mind. Those not similarly gifted had better steer quite clear of the thoroughfare. Overbridges or subways would doubtless be better, theoretically, than refuges, if the public could be made to use such alternatives. The unfortunate thing, however, is that people prefer to take considerable risk rather than to go up and down a few steps. That being the case, it would simply be wasting money to build bridges and subways, at any rate to the extent required to provide adequately for crossing the Embankment in every section of its length.

The German Cement Specification.

The new standard specification formulated by the Association of German Portland Cement Manufacturers constitutes one more proof of the useful work conducted by that body during the past thirty years. From year to year its deliberations have been marked by the serious desire to improve the quality of a valuable and to-day an almost universal structural material, and its leaders—among whom may be mentioned Dolbrueck, Dyckerhoff, and Schumann—are well known as authorities of high standing. The new specification differs somewhat from that issued by the Engineering Standards Committee. It allows rather more magnesia and slightly less sulphuric anhydride, the tensile strength of 1 : 3 cement and sand briquettes is 227 lb. per square inch as compared with 250 lb. per square inch, and it permits the residue of 5 per cent. as against 3 per cent. in a sieve with 5,776 meshes per square inch. There are, of course, other differences between the two documents which should be compared in detail and at leisure by cement users. A great thing in favour of the Association is that all its members are bound to comply with the standard specification and to supply Portland cement meeting the requirements of the Prussian Ministry of Public Works.

Red Cement for Resisting Sea Water.

In the current issue of the *Journal* of the Society of Chemical Industry is a paper by Mr. C. J. Potter on "Chemical Changes in Portland Cement Concrete, and the Action of Sea Water Thereon," which was recently communicated to the Newcastle section of the Society. Mr. Potter has found that a cement made by grinding six parts by weight of calcined red brick clay with ten parts of Portland cement clinker is far superior to Portland cement alone for work exposed to the action of sea water. This cement he calls "red cement." By immersing briquettes in sea water and fresh water respectively, for periods extending to ten years, Mr. Potter has found that Portland cement continually decreases in strength in sea water, but increases steadily in strength in fresh water. On the other hand, red cement continually increases in strength in sea water, but is always inferior to Portland cement in fresh water, although, like Portland cement, it steadily increases in strength in fresh water. Briquettes made with five parts sand and one part red cement were very porous, but, nevertheless, continued to increase in strength during the nine years they remained in

sea water. Mr. Potter admits that he cannot explain why sea water is so much more beneficial than fresh water in its action upon red cement. He states that over 5,000 tons of red cement have already been used in various sea-water and fresh-water works, and that the results have been very satisfactory.

Old and New Monuments.

IN reference to a proposal to erect a new monument over the grave of Sir John Moore at Corunna, the Rev. B. H. Alford makes, in a letter to the *Times*, a very sensible protest which is of wider application than to this particular case. He says, in regard to the present monument, "the sarcophagus and its ornaments are old-world, if you please, but then they are in keeping with the fashion of the hero's time, and have been toned down by age into harmony with the beautiful things around"; and he adds a question as to whether we are really "bringing a great man's honour up to date" by refashioning a tomb to suit our present artistic taste. It is a point to be borne in mind in connexion with the subject of old monuments generally. They may not represent our present taste, but they represent the taste of those who erected them, and which has also some claim to respect. That is the defence of the monuments in Westminster Abbey, many of which we should disapprove of now; but we have no moral right to remove them in favour of our modern ideas; and the same applies to such a case as that of Moore's tomb at Corunna. Erect a more important monument elsewhere if you like, but do not disturb the old one. Mr. Alford's protest is made in a right spirit, and we hope it will be acted on in this and other cases.

"The Fortune Playhouse," Soho.

FOR their new quarters in Soho the English Drama Society have adopted the name of the theatre which Peter Street, a carpenter, built for Edward Alleyn and Philip Henslowe in Golding, now Golden, lane, Cripplegate Without. Street's contract, dated January 8, 1599-1600, was printed by Boswell in his Malone's Shakespeare. The playhouse in Soho is not, however, a new building. It is one of the very few, if not indeed the last, remaining of the old concert-rooms of London. The room stands at the rear of No. 41, Brewer-street, Golden-square, and has retained most of its original appearance, but the way opening from Windmill-street had been latterly blocked in The room was built in 1737-8 for Hickford, a famous dancing master, and during nearly forty years performances were given there by many of the eminent musicians and composers of the day—the long list of performers' names includes those of the Arnes, W. Cramer, Beard, J. C. Bach, M. Clementi, Dubourg, etc. When Leopold Mozart came to London in April, 1764, he took lodgings for himself and his two children in Cecil-court, St. Martin's-lane, and the first appearance of young Mozart was advertised to take place in Hickford's Room. He and his sister gave a concert there in May, 1765, shortly before they quitted England. Some years ago Hickford's Room became Willis's Dancing Academy, a circumstance which has sometimes caused it to be confused with Willis's Rooms, St. James's. It has recently been occupied by a club.

Memorial to the late G. F. Bodley, R.A.

A COMMITTEE has been formed to consider the erection of a memorial to the late G. F. Bodley, and it is proposed that this should consist in the carrying out, at the Church of the Holy Trinity, Kensington Gore, of a reredos for which Bodley himself made the design, with the addition also of a commemorative tablet with a portrait and a suitable inscription in another part of the same church. Any of our readers who wish (as many of them no doubt will) to subscribe to this memorial, can send subscriptions to the Hon. Treasurer, the Rev. H. B. Coward, Church of the Holy Trinity, Prince Consort-road, Kensington Gore, S.W. We may refer our readers to the illustration of Bodley's design for the Reredos or Triptych in question, which forms one of the plates in the present issue.

The Design Club.

A CLUB has been started under the name of "The Design Club," which has for its object to bring together artists who have made or are making their living by design applied to industry and manufactures. A certain number of producers and distributors who take an interest in the industries with which they are connected are also to be eligible as "lay members." This may have a good influence in bringing together also manufacturers and artists, and raising the artistic standard of work, which in some industries is much in need of raising. The Secretary of the Design Club is Mr. Lindsay P. Butterfield, 22, Newman-street, from whom all further information can be obtained.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE usual fortnightly meeting of the Royal Institute of British Architects was held on Monday at 9, Conduit-street, W., Mr. Ernest George (the President) in the chair.

Public Abattoirs.

Mr. R. Stephen Ayling read a paper on "Public Abattoirs," of which the following is an abstract:—

From a humanitarian point of view it is our bounden duty to animals that they should be killed as painlessly and under the best conditions possible; it is a duty to ourselves that meat supplied for human consumption should be free from disease; that those places in which the work of slaughtering and dressing meat foods take place should be as hygienically perfect as possible; and it it is an important matter of policy that by-products and other valuable materials should be utilised to their fullest extent. These essentials can only be achieved by the establishment of public abattoirs throughout the country, and by the elimination of private slaughter-houses.

When the public abattoir system is established as firmly here as it is to-day on the Continent, there will be a very wide field open for the English architect to design these utilitarian but certainly complex buildings, well planned and with a distinctive character.

In England and Wales to-day we have nominally about ninety-eight public abattoirs; but nearly two-thirds of the buildings are very small, or obsolete in planning; in fact, a large number cannot be really seriously considered as public abattoirs at all. Even if they were all satisfactory this number would represent one institution to about every 330,000 inhabitants. As a matter of comparison, taking one-third of the existing abattoirs as being reasonably representative buildings, we have to-day in England and Wales one public abattoir to each million of the population. It is therefore apparent that we have hardly reached the fringe of an "abattoir system." In Paris to-day there are two splendid municipal abattoirs, supplying the meat for the whole of the city, and not a single private slaughter-house. In London alone to-day we have about 294 private slaughter-houses and not a single municipal one.

The author showed the disposition of the private slaughter-houses, licensed last year by the London County Council, in the area covered by the map published in the London Directory. There are 222 private slaughter-houses in that area, and in nearly every case they are in the midst of residential property. The fact that they should exist at all, many in populous districts and surrounded by houses, is an offence to humanity, hygiene, and economy. We pride ourselves on the enormous strides we have made in sanitary science during the last fifty years, but on this particular subject we are at least a century behind our Continental neighbours. Recently plans have been prepared for a public abattoir in Constantinople, and the work either has been or shortly will be commenced. When this has been accomplished, London will stand in "splendid" isolation by being the only European capital without such an institution.

The author enumerated the many defects inseparable from the system of scattered private slaughter-houses, and showed how they can be, and are, prevented in the public abattoir. Almost invariably on the Continent (and sometimes in England) these buildings are erected in the suburbs, and in close proximity to a railway, so that the necessity for driving animals through the streets does not exist. Diseased meat sold for food is practically unknown owing to the employment of fully-qualified veterinary inspectors, who are continually on the spot while animals are being killed. Wanton cruelty is reduced to a minimum, as the municipal buildings are under the fierce light of publicity, the officials are continuously in attendance, and only trained men are engaged as slaughterers.

Having dealt with the question of finance, and given statistics to show that public abattoirs can be made self-supporting or even profitable, the author set out the salient points to be observed in a well-planned abattoir. The existing buildings of this kind can be, broadly, divided into two classes, those on the "block system," where all the main departments are under one roof, and the "separate system," where the main buildings are separated by roads or passages. The main buildings of a moderately-sized abattoir consists of lairs for various animals, slaughter-hall, cooling-room, administrative block, superintendent's house, cold stores and chill-rooms, destructor, buildings for the preparation of by-products and offal, workmen's mess-rooms, kitchen, bath, etc., and pathological room.

The author described the magnificent Cattle Market and Abattoir of La Villette, Paris, designed by M. Janvier, and opened in 1867, and showed illustrations of the various markets, buildings, and slaughter-courts. The area is 105 acres, and about two and a half million animals are killed there per annum.

Illustrations were shown also of three typical German abattoirs, viz., those at Berlin, Leipzig, and Offenbach. Some of the Continental abattoirs are among the finest buildings erected. While Birmingham spends nearly 5s. a head for its abattoir, the little town of Offenbach, in Germany, for instance, has spent 1*l.* 13s. 7d. per head of its 60,000 inhabitants.

Turning to English abattoirs, the author considered the plan of the abattoir at the

dockyard, Chatham, most perfect, not only from the humanitarian point of view, but as regards facilities for working. The plan is the outcome of a report of the Commission appointed by the Admiralty to inquire into the question of the "humane slaughtering of animals," and the many witnesses examined were all experts engaged in those trades and professions appertaining to the subject. The main points in the report were as follows:—"That animals awaiting slaughter should be spared any contact with the signs or smell of the slaughter-house; that waiting-pens should be separated from the slaughter-chamber by sliding-doors; that floors should be impervious and not slippery; that cattle should be slaughtered screened off from their fellows; that immediately the carcasses have been bled they should be dressed in an adjoining chamber, screened off from view of animals entering the slaughter-house." These recommendations have been admirably carried out at Chatham. The buildings were designed in the Admiralty Office under the superintendnce of Mr. J. Brooker Hunt.

Plans, elevations, and in some cases photopraphs of a number of public abattoirs in England, including a unique plan suggested by the Model Abattoir Society, were exhibited and points of interest called attention to.

In Scotland to-day, out of 206 burghs, 124 of them, or nearly 61 per cent., have public abattoirs and greatly-added powers for closing the private slaughter-houses. The Local Government Board of Scotland is now advocating the erection of public abattoirs in or near all towns. A radius of five miles is suggested for towns with from 6,000 to 8,000 inhabitants. Scotland is much in advance of England, and is gradually approaching an "abattoir system."

As regards materials, in the erection of these buildings wood should be used only where absolutely necessary. Stability and facilities for scrupulous cleanliness must be the keynote. The floors must be of perfectly impervious material, and white glazed brick-work or tiles largely used in the interior of the buildings, so that every trace of dirt or blood may be easily detected and removed. Throughout the buildings very light paint—preferably white—should be employed.

The question for or against public abattoirs appears to the author to be a national rather than a political one. He was strongly of opinion that a general "abattoir system" would encourage the British farmer to raise home-grown cattle, which would not only be to his pecuniary advantage, but also benefit the British consumer.

To trade opposition and vested interests the author attributed the fact that public abattoirs have not superseded private slaughter-houses in this country. Trade opposition is very strongly against the abattoir system, as under it inspection of meat would naturally be more stringent than is possible at the present time, so that diseased meat food would be condemned in a much greater proportion.

In some concluding remarks reference was made to the question of "official architecture" in connexion with the subject. Abattoir buildings complying with various requirements, complex engineering work, elaborate sanitary work, considerations of humanity in stabling and slaughtering, the most efficient methods of veterinary inspection, etc., all tend to render them practically impossible to be designed by a single individual, however talented. In any large abattoir scheme the architect, engineers (constructional and municipal), medical officer of health, and veterinary surgeon should work together harmoniously.

Mr. Sydney Perks said he would like to make a few remarks more in the nature of a protest than anything else. The lecturer had apparently carefully considered many model plans, but on going round the walls and looking for the names of the architects and engineers who were responsible for the plans he did not see the lecturer's name on one. If the lecturer had not carried out the design for a slaughter-house—which apparently he never had—then he (the speaker) thought he might at least have drawn some model plan which might have been a guide to those who might have to do such work. The lecturer said that they had 294 slaughter-houses in London, but not a single municipal one. He also stated, "Recently plans have been prepared for a public abattoir in Constantinople, and the work has either been or shortly will be commenced. When this has been accomplished, London will stand in 'splendid' isolation of being the only European capital without such an institution." If Mr. Ayling meant by "municipal" that there was not a single slaughter-house which had been put up at the expense of the rates, then he was right; but they had a great improvement on that. At Islington they had an abattoir which had been put up for public use, and not one penny of the cost had come out of the public pocket. The Corporation of the City of London, who were responsible for the markets and for the inspection of food and so on, had spent between 30,000*l.* and 40,000*l.* in putting up public slaughter-houses at Islington. Those slaughter-houses had been in contemplation for some years, and the committee responsible for them went to Germany and saw the abattoirs there, and they also went to the principal towns in England where they had such slaughter-houses, and as a result of many years' thought the buildings at Islington were opened a little over a year ago. The lecturer might say, "But are these slaughter-houses public?" All he (the speaker) could say was that if anyone had a pig and sixpence in his pocket he could go and kill it at Islington, or he could kill a calf for threepence, a bullock for one-and-sixpence, or a sheep for twopence; and, further, they would find there a qualified veterinary surgeon with a staff of assistants to see that the work was properly done. At Islington they would find humanitarian and sanitary improvements which did not exist in any other slaughter-house in England and in very few abroad. It was true that not a penny had been spent on architectural work, for the instructions were that the building was to be of stock brick. It was hideously ugly, but perhaps it might be said that there was a certain beauty of monotony. When, however, they got inside they would find that absolutely no regard had been paid to expense in the matter of equipment. The building was not put up to pay, but regard was had to the humanitarian point of view. Over 2,000*l.*, for instance, had been expended on electric hoists, and about 1,000*l.* on a destructor in which diseased animals were destroyed. He was somewhat interested in the Corporation of London, and he wished to enter a protest against it going forward that London was doing nothing.

Mr. J. C. Nicol said that about ten years ago he had the opportunity of interesting himself in slaughter-houses on the Continent, and he quite agreed with the last speaker. At the same time the author had put together a large amount of information which was very difficult to obtain—at least, he found it very difficult to obtain ten or twelve years ago. He was, however, disappointed that more reference had not been made to what had been done in the provinces. The principal point in slaughter-house design was not to follow the French system, where they had the opportunity of stretching their ground plan out to any extent. The abattoirs he visited in Paris were almost all on the same plan, although he understood that that of La Villette had been reconstructed, and no doubt was much improved. Still, the plan would not apply to London or to provincial towns, for the simple reason that they had not the land in the centre of the towns to devote to such a purpose. The Birmingham Corporation provided a considerable-sized market and slaughter-house upon a rather restricted area of ground, and to economise space they hit on the idea of constructing the stables on the top of the slaughter-houses, and this had worked very well, the inclined plane being found quite practicable. In the provinces there appeared to be a great movement for having public slaughter-houses close to the market-place, and he believed they were very paying institutions. The design of the fittings of a slaughter-house was more important than the architecture of the building. Possibly in the arrangement of walls and roofs there was an opportunity for the architect to display some skill, but the design of the fittings for carrying the carcass from the killing-chamber to the refrigerating-rooms, and so on, was of the very greatest importance. The planning even of the most simple building required a great deal of skill and attention, and he thought the author was to be greatly commended for the courage he had displayed in coming forward and reading a paper on what was, after all, not a very savoury subject.

Mr. J. Nixon Horsfield, in moving a vote of thanks to the author, said the subject appealed to him as an outsider who had been through the stock-yards of Chicago and regretted it. Therefore he could sympathise with the movement for doing the necessary work of a stock-yard in a clean and wholesome manner. There was nothing in the subject particularly attractive to them as architects, but they must not disdain to do what they could architecturally to express the efforts being made to cleanse stock-yards. If slaughter-houses were abolished and abattoirs substituted as on the Continent they should try and help make them worthy of their civilisation, and if they did this then they might be able to avoid the criticism which was made in "The Jungle."

The Chairman remarked that the author had given them examples of sumptuous fittings inside, but an absence of external architectural design, and he was afraid that would never do.

The vote of thanks having been put to the meeting and agreed to,

Mr. R. S. Ayling said that Mr. Perks had stated that he did not see his name as architect on any of the plans exhibited on the wall, but that was his (the speaker's) misfortune and not his fault. He hoped eventually if he lived long enough to design an abattoir, but it would not be quite on the lines of that at Islington. Mr. Perks had rated him for not calling that a public abattoir, but it was not. It was built by the City Corporation, and the money did not come from the rates. It was very small in comparison with the large amount expended, and, as was frankly stated at the opening ceremony, the Corporation was indifferent to the prospect of the houses being commercially remunerative. He said that such buildings should be made to pay. They had electric hoists in the place, and in addition, in case anything went wrong with the electric hoists, they had hand hoists. Well, slaughtermen were not weaklings, and he maintained that both were not wanted. He agreed that there was nothing wasted outside, but there was much wasted inside. Mr. Nicol said they had no room in the centre of London to build on broad and comprehensive lines, and he agreed with this, but he maintained that they should build not in the centre of London, but in the suburbs. (A Member: Where?) There was plenty of room. He did not mention particularly the provincial slaughter-houses, because he had not the time, but from the map he had prepared it would be seen that in the district north of a line from the Wash to South Wales was situated nine-tenths of the existing English abattoirs. The other tenth were below that line, which was practically half of England.

Institute Prizes and Studentships.

The Assistant Secretary read the deed of award of prizes for studentships made by the Council in writing under the common seal,

in accordance with by-law 66. The awards were as follows :—

The Institute Silver Medal and Twenty-Five Guineas (Essays).—Subject, The Influence on Architecture of Modern Methods of Construction.—Mr. Henry H. Hill, B.A., 10, Kildare-gardens, Bayswater; award of 10*l.* 10s., Mr. Horace Cubitt, A.R.I.B.A., 227-228, Strand, W.C.; hon. mention, Mr. J. MacLaren Ross, 11, St. James-street, Bedford-row.

The Institute Silver Medal and Ten Guineas (Drawings).—Subject, Measured Drawings of Ancient Buildings in the United Kingdom or Abroad.—Mr. Ernest W. Wray, 28, Scott-street, York; second, Mr. Alan G. Brace, "Coolderry," Lapworth, Warwickshire.

The Soane Medallion and 100*l. (for Continental Travel).*—Subject, Design for a Casino on the Borders of a Lake.—Mr. Anthony R. Barker, "Sutherlands," Harrow; hon. mention and 21*l.*, Mr. Adrian Berrington, 37, Gt. Ormond-street.

The Owen Jones Studentship: Certificate and 100*l. (for Travel and Study of Colour).*—Application and drawings from S. Herbert Maw.—The Council awarded a certificate and 21*l.* to the applicant.

The Pugin Studentship: Silver Medal and 40*l. (for Travel in the United Kingdom).*—Mr. Sydney H. Miller; hon. mention and 10*l.* 10s., Mr. H. Hubert Fraser.

The Tite Prize: Certificate and 30*l. (for Travel in Italy).*—Subject, Design (according to the Principles of Palladio, Vignola, Wren, or Chambers) for a Covered Arcade of Shops.—Mr. R. W. M. Gunn, 2, Windsor-terrace, Glasgow; 15*l.* 15s., Mr. Bertram Edwin Lisle, 43, Devereau-road, Wandsworth Common; 10*l.* 10s., Mr. S. H. Maw, The Beeches, Cottingham-road, Hull.

The Arthur Cates Prize: Forty Guineas.—Mr. Leslie Wilkinson.

The Grissell Gold Medal and Ten Guineas (for Design and Construction).—Subject, Design for a Landing Stage to a Royal Palace from a Lake.—Mr. Douglas W. Day, Deerhurst, Knighton Drive, Leicester.

Godwin Bursary: Silver Medal and 65*l.*—Mr. J. A. Allan.

Ashpitel Prize.—Mr. Horace Jas. Ash, Nuneaton.

The Chairman announced that the next meeting would be held on Feburary 1, when the name of the person the Council proposed to submit to the King for the Gold Medal would be announced.

THE SOCIETY OF ARCHITECTS.

MR. G. A. T. MIDDLETON presided, on Thursday last week, at a meeting of the Society of Architects, when Professor Henry Adams, M.Inst.C.E., read the following paper on

THE STABILITY OF WALLS.

"In order to bring the subject of stability of walls within the limits of time permissible in a single evening it is proposed to deal only with one class of walls, viz., those known as boundary, enclosure, or fence walls, which have no load but their own weight to support, and no thrust but that produced by the wind to resist. They are not of great importance in themselves, but they will serve as a medium for the introduction of the general principles of determining stability and save our time when we consider more important cases on a future occasion.

By making one or two assumptions the main principle can be shown very easily, but in the application of this principle to practice there are various points open to discussion, and the actual stability is by no means so certain as might generally be supposed. To make the subject perfectly clear, we will commence with a simple wall of uniform rectangular section, assuming that the wind is blowing horizontally and uniformly over one face, that there is no tensile strength in the mortar, and that the wall would ultimately fail by overturning on the outer edge at the ground line *without crushing the edge.*

Let *a b c d* Fig. 1 be the section of wall, and as the reasoning that applies to one foot of its length applies to every foot, it will be convenient to consider a length of 1 ft. run. Then the total force of the wind will be the pressure per square foot multiplied by number of square feet (*i.e.*, the height, because we are only considering 1 ft. of the length), and the centre of action will clearly be at half the height, the leverage to overturn the wall on point *a* will thus be x. It is not the distance measured from the point of P diagonally down to point *a*, because the leverage of any force must be measured from the fulcrum *perpendicularly to the direction* of the force. The wall being of uniform substance and recangular in section, the centre of figure will be the position of the centre of gravity, marked c.g., where the whole weight may be considered as acting. This weight W is the weight per cubic foot multiplied by number of cubic feet (*i.e.*, the height by the thickness, the length being 1 ft.), and its leverage, resisting the overturning on *a*, will be y. It is assumed that there is no tensile strength at point *b* to hold the inner edge down, as when the wall is new the cohesion of the mortar cannot be relied upon.

Let p = wind pressure per square foot in lb.
w = weight per cubic foot of wall in lb.
h = height of wall in feet.
t = thickness of wall in feet.
P = total wind pressure in lb.
W = total weight of resistance in lb.
x = leverage of wind in feet.
y = leverage of resistance in feet.

then

P = $p\,h$, $x = \frac{1}{2}h$, Px = moment of wind pressure,
W = $w\,h\,t$, $y = \frac{1}{2}t$, Wy = moment of resistance,

and by the laws of equilibrium Px = Wy, therefore $p\,h \times \frac{1}{2}h = w\,h\,t \times \frac{1}{2}t$, or $p\,h = w\,t^2$, whence

$$p = \frac{wt^2}{h} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$h = \frac{wt^2}{p} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

$$t = \sqrt{\frac{ph}{w}} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (3)$$

If we consider the wind pressure which will just overturn the wall as the measure of stability, then the stability of such a wall varies as $\frac{wt^2}{h}$, or directly as the weight per cube foot, inversely as the height, and directly as the square of the thickness.

This may be shown by parallelogram of forces as in Fig. 2. Draw to any scale the outline of section *a b c d*, and mark the position of centre of gravity; draw a line vertically through the centre of gravity equal in length to the total weight W upon any given scale, measuring from the line of direction of the resultant of the wind pressure, which in this case will pass through the centre of gravity of the wall; at its extremity darw a horizontal line of indefinite length, then from the centre of gravity draw a line through point *a* to cut the horizontal line, and P will be the total wind force, or $\frac{P}{h}$ the wind force per square foot to just overturn the wall. The other lines forming the parallelogram, and shown dotted, are frequently omitted.

Suppose a standard be taken of 112 lb. per cube foot for weight and 28 lb. per square foot, for wind pressure, then by formula (2) for simple overturning, a wall

1 ft. thick would be 4 ft. high.
2 ,, ,, ,, ,, 16 ,,
3 ,, ,, ,, ,, 36 ,,

or the height of any wall would be four times the square of the thickness, . . . (4) which for various reasons would not accord with practice.

There is another contingency which is theoretically possible, viz., that the wall instead of overturning, may slide on the bed joint. The resistance to sliding depends upon the weight and the nature of the surfaces in contact; it is directly proportional to the weight multiplied by a fraction called the "coefficient of friction," varying with the surface. If the mortar has any cohesive strength this coefficient of friction would merge into the resistance of the mortar to shear stress.

Let μ = the coefficient of friction, then for equilibrium P = Wμ, or $p\,h = w\,h\,t\mu$, whence $p = w\,t\mu$ . . . . . (5). It is evident that there must be a certain proportion of thickness to height where the tendency to overturn or slide would be equal; this will be when $\frac{wt^2}{h}$ (1) = $wt\mu$ (4), or, by cancelling, when $\frac{t}{h} = \mu$ . . . . (6) that is, when the ratio of thickness to height is equal to the coefficient of friction, and this being 0·5 for fresh mortar it would require the wall to be only twice the thickness high.

Now, unfortunately, when we come to apply these elementary principles to practice, we are beset by difficulties on every hand, and although an architect's innate sense of fitness may enable him to provide a suitable section for a wall of any height there are times when he should be able to give a reason "for the faith that is in him," and to do so it will be necessary to make various digressions to ascertain the basis upon which practical calculations must rest.

Walls have been designed so that the overturning moment shall not exceed one-half to two-thirds that which calculation would show to be necessary to produce overturning, but this is a very crude and improper mode of designing, and the author will now endeavour to indicate the true basis upon which it should proceed.

STRENGTH AND WEIGHT OF MATERIALS.

These will vary considerably according to individual samples, but an average may be taken as follows :—

Material.	Safe Dead Load per ft. super.	Factor of Safety.	Weight in lb. per cub. ft.
Granite masonry	15 tons	20	160
Portland and hard limestone	15 ,,	15	140
Sandstone well bedded	12 ,,	10	130
Blue brick in cement	9 ,,	8	120
Stock brick in cement	6 ,,	5	115
Stock brick in lias mortar	5 ,,	4	112
Stock brick in grey lime mortar	3 ,,	4	112
Portland cement concrete	5 ,,	8	130
Lias lime concrete	3 ,,	8	120
Gravel and natural compact earth	2 ,,	—	112
Made ground rammed in layers ..	1 ,,	—	110

The safe compressive loads given above vary from $\frac{1}{4}$th to $\frac{1}{100}$th of the ultimate resistance; the factor of safety is calculated from the load at which fracture commences. It is necessary to allow a large margin for contingencies, and the figures named agree fairly with ordinary practice.

The safe tensile strength of old grey lime mortar may be taken at 1 per ton per square foot. The coefficient of friction, including resistance to shear, in fresh mortar joints according to different authorities = 0·5 to 0·75 of the load. The shearing strength of old mortar may be taken at $\frac{2}{3}$ ton per square foot. The author of "Notes on Building Construction" gives the safe tensile strength as follows :—

	Per sq. in.		Per sq. ft.
Brickwork in cement, fresh..	0·5 cwt.	=	3·6 tons
,, ,, 6 months old	2 cwt.	=	14·4 ,,
,, lias lime, fresh ..	0·1 cwt.	=	0·72 ,,
,, ,, 6 months old	36 lb.	=	2·314 ,,

A maximum pressure of 10 tons per square foot is sometimes allowed on brickwork at the overturning edge, but it must be remembered that crushing may commence with this pressure. No mention has been made of clay as a foundation, as no single figure can express its value; very much depends upon circumstances. In deep foundations, say, exceeding 10 ft. from surface, the London clay will bear 5 tons per foot super. safely. In shallow foundations a pressure of 1½ tons per foot super. would be reasonable, but in such a case it is not compression of the subsoil that is to be feared; the alternations of drought and moisture cause alternate contraction and expansion of the clay, and a movement of the superstructure is certain to follow, unless special precautions have been taken, more particularly where the surface is sloping, as on a hillside.

WIND PRESSURE.

The pressure of wind against a plane surface perpendicular to its direction is not yet fully understood; it is, of course, a product of the velocity, but it varies according to laws which have not yet been reduced to correct formulæ, even if it be possible ever to arrive at more than a vague generalisation. From the experiments which have been made it appears that surfaces of a few feet area give a greater resistance per unit of area than smaller surfaces, and that very large surfaces are never subject to a uniform pressure over their whole area, so that the mean pressure is again reduced. It has been generally assumed that the force varies as the square of the velocity, and that the effect depends solely upon the area of the resisting plane. Pressures equivalent to 60 lb., and even 80 lb., per square foot have been recorded in England, but 56 lb. is probably ample to allow for under any circumstances, and it is doubtful whether this has ever been actually reached. Half this amount, or 28 lb. per square foot, is enough to allow in rough calculations for boundary walls and similar structures near the ground level, unless in an unusually exposed situation.

The following table shows the average classification of wind force collated from various sources:—

Average Classification of Wind Force.

Description.	Velocity in Miles per hour.	Approximate Corresponding Pressure lb. per sq. ft.
Barely perceptible wind ..	2½	1/32
Light breeze	5	¼
Pleasant breeze	7½	½
Good breeze	10	¾
Strong breeze	15	1½
High wind	20	2
Half gale	30	4½
Strong gale	40	8
Whole gale	50	12½
Great storm	60	18
Hurricane	80	32
Violent hurricane	100	50

By Smeaton's formula $p = \frac{v^2}{200}$

The pressures given in this table, although usually accepted, are only approximately correct, as at and near the critical point of, say, 1,100 ft. per second, the resistance is in a much higher ratio than v^2, while below 100 ft. per second, it is more nearly as the velocity simply.

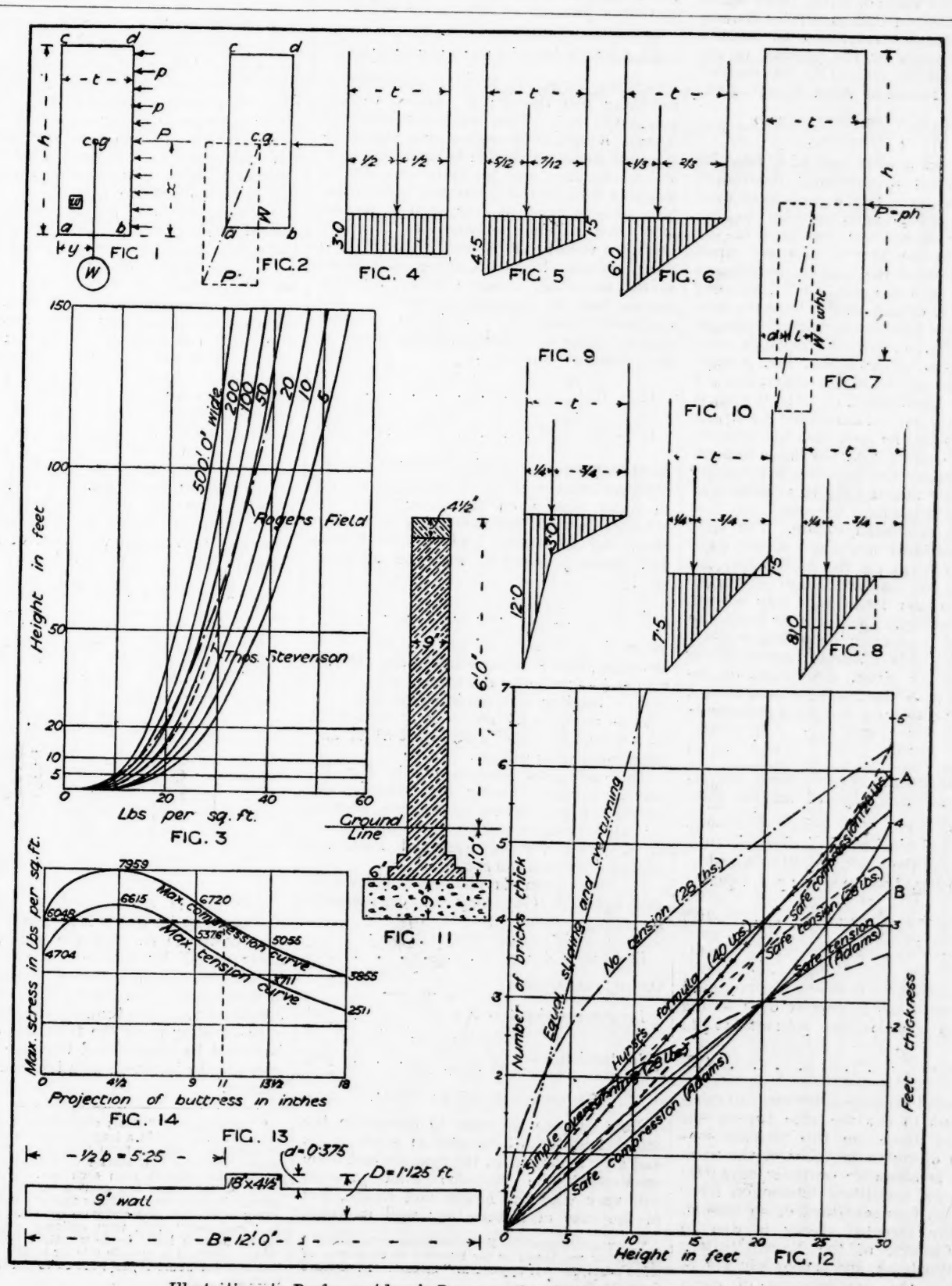
The author has given considerable attention to the subject of wind pressure, and its modification according to the width and height of the surface exposed to its force. He has constructed the following empirical formula for practical use where it is desirable to obtain the closest approximation to actual conditions, viz.:—

$$\log p = 1{\cdot}125 + 0{\cdot}32 \log g - 0{\cdot}12 \log l \quad \ldots\ldots\ldots (7)$$

where p = ultimate wind pressure in lb. per sq. ft. necessary to be allowed for against a plane surface perpendicular to the direction of the wind.

g = height of centre of gravity of surface considered, above ground level in feet.

l = width in feet of part to be taken as one surface.



Illustrations to Professor Adams's Paper on the Stability of Walls. Plate I.

This would give allowances as in the following table for which the curves are plotted in Fig. 3:—

Wind Pressure lb. per sq. ft. on Plane Surface.

Height in Feet.	Length in Feet.						
	5	10	20	50	100	200	500
150	54·6	50·3	46·3	41·4	38·1	35·1	31·4
100	48·0	44·2	40·7	36·4	33·5	30·8	27·6
50	38·4	35·4	32·5	29·1	26·8	24·7	22·1
20	28·7	26·4	24·3	21·7	20·0	18·4	16·5
10	23·0	21·1	19·5	17·4	16·0	14·8	13·2
5	18·4	17·0	15·6	13·9	12·8	11·8	10·6

(For very exposed positions 25 per cent. may be added.)

For additional notes on wind pressure by the author, reference may be made to his papers "Wind Pressure on Roofs," read before the Society of Architects in 1893, and "The Force of Wind," read before the City of London College Science Society in 1895. Reference may also be usefully made to a Report by the Director of the Meteorological Office, Official No. 180, entitled "The Beaufort Scale of Wind Force," 1906.

Combination of Weight and Wind Pressure.

The weight of a plain wall of rectangular section produces a uniformly distributed load over the base, and a horizontal wind blowing against it adds nothing to the weight, but throws the resultant of the forces over to the leeward side and alters the distribution of the loading, reducing it on the side next the wind, and increasing it to a similar extent on the opposite side, so that the sum total of the reactions remains the same. Fig. 4 shows the reaction when the resultant is in the centre, Fig. 5 when it has been forced out of the centre, but not so far as the middle third, and Fig. 6 when it just reaches the limit of the middle third. At this point, it will be seen that the pressure is reduced to nothing on the inside and increased to double the mean on the outside. It is generally stated that this position of the resultant is the limit for safety, but it is an incorrect expression to use. The limit of the middle third only signifies that there will be no tension on the inner edge, the compression on the outer edge will vary according to the load, and may exceed the limit of safety. On the other hand, the middle third may often be passed without exceeding the limit of safety. Adopting the notation already given, the weight of the wall will be $W = w\,h\,t$, and the area of base for 1 ft. run $A = t \times 1$, the mean pressure on the base will then be

$$\frac{W}{A} = \frac{wht}{t} = w\,h \quad . \quad (8)$$

and the maximum pressure when the resultant is at the edge of middle third

$$\frac{2W}{A} = 2\,w\,h \quad . \quad (9)$$

The position of the resultant will be found by reference to Fig. 7 where $w\,h\,t : p\,h :: \frac{1}{2}h : l$,

$$\text{whence } l = \frac{ph \times \frac{1}{2}h}{wht} = \frac{1}{2}\frac{ph}{wt} \quad . \quad (10)$$

$$\text{and } d = \frac{1}{2}\frac{ph}{wt} - \frac{1}{2}t = \frac{1}{2}\left(\frac{ph}{wt} - t\right), \quad . \quad (11)$$

By the same figure it will be observed that when the resultant is pushed over to the edge of the middle third $p\,h : w\,h\,t :: \frac{1}{6}\,t : \frac{1}{2}\,h$ whence

$$p = \frac{wt^2}{3h} \quad . \quad (12)$$

When the wind pressure is sufficient to cause the resultant to cut the base beyond the middle third there are two possible conditions, (*a*) owing to freshness of the work no tension is allowable on inner edge; (*b*) matured work permitting tension on inner edge. In the first condition, of no tension, the generally accepted theory is due to Professor Crofton, of the Royal Military Academy, Woolwich, and is shown in Fig. 8. The base of the parallelogram of mean pressure and triangle of reactions is set out three times the length of the distance from the resultant to the overturning edge; the depth of parallelogram is made equal to the mean pressure on the base supposing only that portion of the thickness effective, and the depth of triangle will be double the parallelogram. From this it results that the maximum pressure at outer edge will be

$$\frac{W}{3d} \times 2 = \frac{2}{3} \times \frac{W}{d} \quad . \quad (13)$$

Now, the author finds some difficulty in accepting this theory; it appears to him reasonable that, as the base may be looked upon as a rigid body resting on a plane, the pressure might be divided in some way over the whole area, and he finds that Fig. 9 complies with all the theoretical tests he has been able to bring to bear upon it, and he offers this as an alternative to Professor Crofton's theory. If it be the correct view it is important to give it due consideration, as the maximum pressure shown by it is greater than by the ordinary method. The maximum pressure K and the pressure directly under the resultant R are given by the following formulæ:—

$$K = W\left(\frac{2}{d} - \frac{4}{t}\right) \quad . \quad (14)$$

$$R = W\left(\frac{4d}{t^2}\right) \quad . \quad (15)$$

In the second possible condition, of the work being sufficiently mature to permit the mortar to resist tension on the inner edge, the ordinary formula for combining a longitudinal and transverse load, or direct load and bending moment, may be adopted, viz.:—

$$S = \frac{W}{A} \pm \frac{M}{Z} \quad . \quad (16)$$

where S = stress in lb. per square foot at the edges, the + value being for compression side and — value for the tension side.

M = bending moment in pound-feet.

Z = modulus of section,* in foot units = $\frac{1}{6}\,t^2$ for 1 ft. run of wall, or $\frac{1}{6}\,b\,h^2$ for any other rectanglar section.

This will give reactions as in Fig. 10, and it is worth noting that whether the resultant is pushed over to the given position by wind pressure, or is there by reason of a direct vertical non-axial load, the resulting stress is the same.

Or, for 1 ft. run of a plain rectangular wall, the equation (16) may be conveniently given in the form

$$S = w\,h + \frac{3ph^2}{t^2} \quad . \quad (17)$$

Or by transposition

$$\text{for compression } t = \sqrt{\frac{3ph^2}{Sc - wh}} \quad . \quad (18)$$

$$\text{for tension } t = \sqrt{\frac{3ph^2}{St + wh}} \quad . \quad (19)$$

Stresses on Given Wall.

Now suppose we wish to determine the safe height for a 9-in. wall in stock bricks and grey lime mortar, the formula and table show that the probable wind pressure will vary with the height and length, but in the case of a boundary wall it would manifestly be unsafe to take the whole length in estimating the wind pressure, as it is possible for a portion of it to blow down and leave the remainder standing. If there were buttresses we should limit the width taken into consideration as equal to the distance from centre to centre of the buttresses, or, say, one and a half times the height, and this is a reasonable length to take into account if there are no buttresses.*

Assume 6 ft. height above ground as in Fig. 11, = 3 ft. as the height to centre of gravity, and 9 ft. as the length, and by formula (6) $\log p = 1{\cdot}125 + 0{\cdot}32 \log 3 - 0{\cdot}12 \log 9 = 1{\cdot}125 + 0{\cdot}1526788 - 0{\cdot}1145091 = 1{\cdot}1631697$, whence $p = 14{\cdot}563$ lb. per square foot. Then by formula (13) the stress on the two edges will be $S = \frac{W}{A} \pm \frac{M}{Z}$, or by formula (14) which is more convenient for this case,

$$S = w\,h + \frac{3ph^2}{t^2} = 112 \times 6 \pm \frac{3 \times 14{\cdot}563 \times 6^2}{{\cdot}75^2} = \begin{matrix} +\,3468 \\ -\,2124 \end{matrix} \text{ or } 1{\cdot}55 \text{ tons}$$

per square foot on the compression edge and ·95 tons per square foot on the tension edge, from which it is clear that we could not safely have made it any higher or the wall would have been liable to fail by tension on the windward side. In small walls like this there is a contingency which it is practically impossible to provide against, and that is overturning by frost, although good mortar will minimise the risk. About the year 1880 the author was concerned with a case where an average length of 20 ft. of four 9-in. brick party-fence walls 5 ft. high, dividing adjacent properties, was overturned in the same night apparently from this cause. The walls ran east and west, and a rain driving from the north was followed by a sudden sharp frost. There was at the same time some wind, but not nearly enough to cause any risk to the walls without the frost, and they all fell southwards.

It would be an advantage if the thickness requisite for a wall of a given height could be directly determined, but it could not be done from the above data; the following table may, however, assist in designing plain boundary walls upon the basis of formulæ (7) and (16).

Safe Thickness of Plain Boundary Walls.

Height of Wall in feet.	Wind Pressure Allowed for in lb. per sq. ft.	Thickness Required in feet.		
		For Compression.	For Tension.	say
5	14·04	·41	·61	1 b.
6	14·56	·5	·73	1 b.
7½	15·22	·66	·91	1½ b.
10	16·13	·93	1·20	2 b.
12	16·87	1·16	1·42	2 b.
15	17·09	1·51	1·71	2½ b.
18	18·13	1·93	2·03	3 b.
20	18·52	2·23	2·23	3 b.
25	19·82	3·0	2·67	4 b.
30	20·09	4·0	3·10	5½ b.

The figures are plotted to curves on diagram Fig. 12, and it is interesting to note that below 20 ft. high the wall would be likely to fail by tension and above 20 ft. by compression, as the curves cross each other at that limit. Curves for the other formulæ are also shown upon the same diagram.

In deciding upon the thickness of a wall it should be remembered that the compression may be increased with less risk than the tension.

* This section modulus Z is sometimes wrongly called moment of resistance, as for instance in catalogues of rolled joists where it appears as "moment of resistance in square inches."

* The author of "Notes on Building Construction" (Vol. IV. p. 227) calls a long enclosure wall one whose unsupported length is more than about ten times its height. He says that shorter walls than these receive considerable support from each end. This, however, seems to the writer too great a length to take into account in estimating stability against wind pressure—owing to the fact that enclosure walls are more liable to "scamping" work than ordinary walls, and the mortar is more liable to deterioration from frost and damp. Perhaps a suitable rule for length to be taken into account would be, say, fifteen to twenty times the thickness.

HURST'S FORMULA.

Hurst's "Architectural Surveyors' Handbook" (13th edition, p. 121) gives a formula for the stability of enclosure walls as follows:—

f = the adhesive force per foot super. attained by the mortar at the end of say 3 months, for brickwork in cement mortar 1 cement to 1 sand = 6,000 lb., 1 to 2 = 5,000, 1 to 3 = 4,000; for brickwork in grey lime mortar 1 to 2 = 3,600; for brickwork in ordinary lime mortar 1 to 2 = 3,000.
H = height in feet above ground.
P = pressure of wind in lb. per foot super., say 40.
T = thickness in feet of a wall with vertical faces and without buttresses.
W = weight of wall in lb. per cubic foot = 112 for brickwork, 145 for Portland and similar stones, 166 for granite.

The formula is given as $T = \sqrt{\frac{PH^2}{\frac{1}{3}f + HW}}$, but there is a very serious omission in it which leads to totally incorrect results. It looks as if the $\frac{1}{3}f$ stands for safe load $\frac{1}{3}$ of ultimate tensile strength of mortar, but this is not so. There should be brackets inserted as follows:—

$$T = \sqrt{\frac{PH^2}{\frac{1}{3}(f + HW)}} \quad . \quad . \quad . \quad . \quad (20)$$

which is identical in form with (18). The different values for some of the items in this formula will, however, give the thickness required for various heights as in the following table, the wind pressure being constant at 40 lb. per square foot:—

Height of Wall in feet.	Thickness required in feet.	Practical Thickness.
5	·91	1½ b.
6	1·08	1½ b.
7½	1·33	2 b.
10	1·73	2½ b.
12	1·99	3 b.
15	2·40	3½ b.
18	2·77	4 b.
20	3·01	4½ b
25	3·60	5 b.
30	4·12	5½ b.

The required thicknesses in this table have been added as a dotted curve on Fig. 12, for comparison with the author's own values which he believes to be safe.

A straight line formula has also been given for the thickness of fence walls, viz.:—

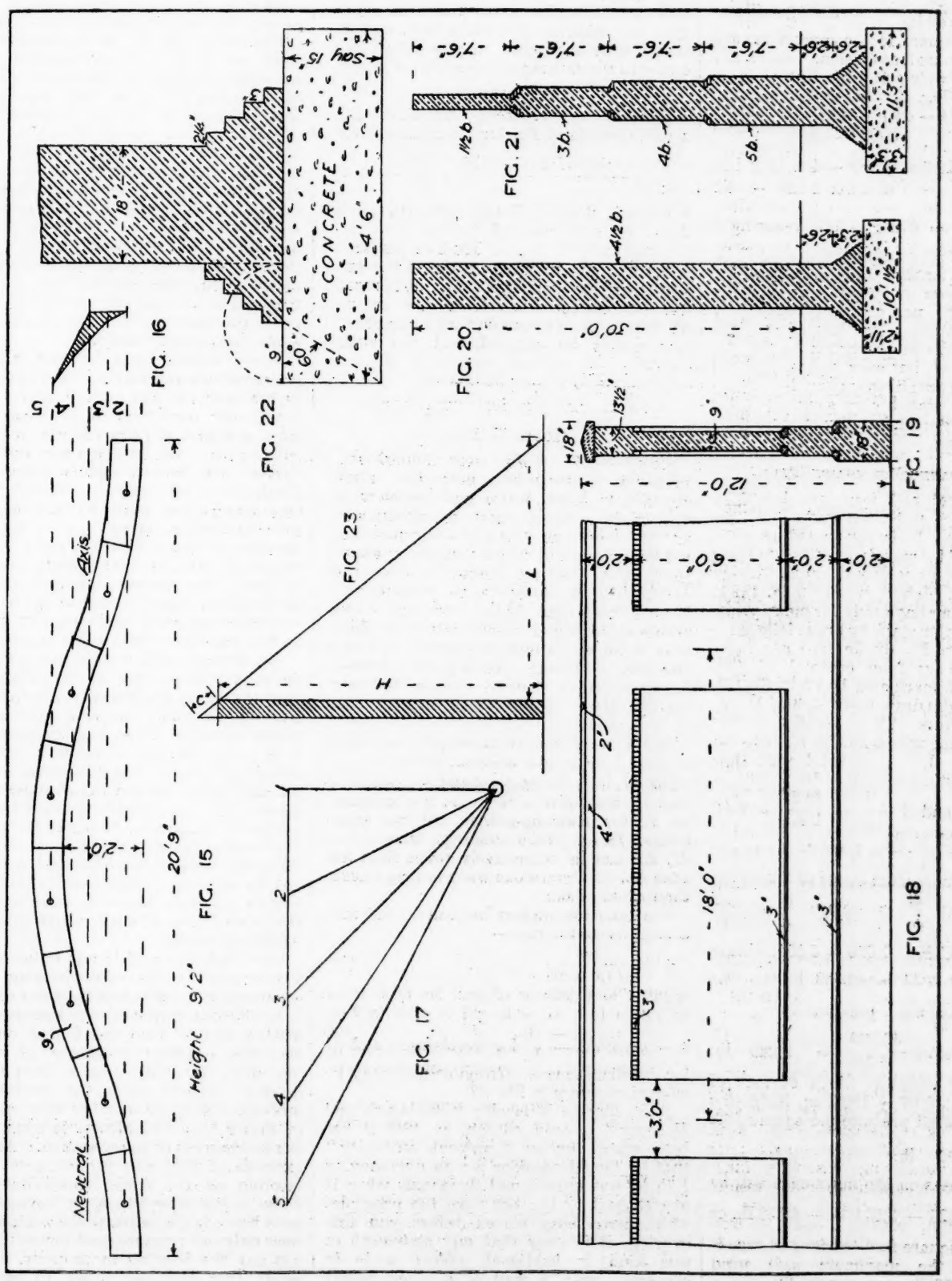
$$h = 6\tfrac{2}{3}\,t \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (21)$$

$$\text{whence } t = \frac{3h}{20} \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (22)$$

This would give proportions as shown by line A on Fig. 12.

For a practically safe and simple rule the author would suggest that the minimum thickness of any fence wall should be $\frac{1}{6}$ of the height which is shown by line B on Fig. 12.

Practical Thickness.	Maximum Height.
1 b.	6 ft. 9 in.
1½ b.	10 ft. 1½ in.
2 b.	13 ft. 6 in.
2½ b.	16 ft. 10½ in.
3 b.	20 ft. 3 in.
4 b.	27 ft. 0 in.



Illustrations to Professor Adams's Paper on the Stability of Walls. Plate II.

WALLS WITH PIERS.

A boundary wall may be strengthened by the simple addition of projecting piers or pilasters built at intervals of, say, one and a half to two and a half times the height or fifteen to twenty times the thickness on one or both sides of the wall—either opposite each other or "breaking joint" with each other at equal intervals. Technically a pier on the side next the wind is a counterfort and the pier on the opposite side is a buttress.

A very curious anomaly occurs in connexion with these buttresses, which would not be credible except for mathematical proof. An illustration will explain. Assume a 9-in. brick wall 6 ft. high and consider a length of 12 ft. unattached; let the brickwork weigh 1 cwt. per cube foot, and the wind blow horizontally with a force of 28 lb. per square foot at right angles to the face. Then the maximum stresses on the base will be $\frac{W}{A} \pm \frac{M}{Z} = \frac{12 \times 6 \times \cdot 75 \times 112}{12 \times \cdot 75}$ $\pm \frac{12 \times 6 \times 28 \times 3}{\frac{1}{6} \times 12 \times \cdot 75^2} = 672 \pm 5{,}376 =$ 6,048 lb. per square foot compression, and 4,704 lb. per square foot tension. Now add a buttress 18 in. wide and projecting 4½ in. in the centre as in Fig. 13. The section modulus will be $Z = \frac{(BD^3 - bd^3)^2 - 4BDbd\,(D-d)^2}{6\,(BD^3 - bd^3)} =$

$$\frac{(12 \times 1{\cdot}125^3 - 10{\cdot}5 \times {\cdot}375^3)^2 - 4 \times 12 \times 1{\cdot}125 \times 10{\cdot}5 \times {\cdot}375\,(1{\cdot}125 - {\cdot}375)^2}{6\,(12 \times 1{\cdot}125^3 - 10{\cdot}5 \times {\cdot}375^3)} = \frac{68{\cdot}4}{82\,3} = 0{\cdot}83.$$

Then $\frac{W}{A} \pm \frac{M}{Z} = 672 \pm 7{,}287$ giving 7,959 lb. per square foot compression and 6,615 lb. per square foot tension. or an increase in the maximum stresses of 30 per cent. in compression and 40 per cent. in tension by adding the buttress. The loss of strength does not continue in proportion to the size of buttress added, but soon reverses, as will be seen by the curve diagram Fig. 14. However, the facts stated give some food for reflection as to the advisability of these piers in ordinary cases.

A CORRUGATED BOUNDARY WALL.

An economical and ingenious boundary wall may be seen at Easton Park, Wickham Market, Suffolk. It is corrugated in plan, the double bend between tangent points being 20 ft. 9 in. with a rise of 2 ft., and although it is 9 ft. 2 in. high it is only 9 in. thick, and has been standing safely for many years. The calculations for stability are as follows:—Draw plan Fig. 15, divide into segments, project force lines from centroid of each towards Fig. 16, mark area 1 to 5 in Fig. 17, and at right angles draw 1 — 0 = half 1 — 5, and draw vectors. Then parallel to the vectors across the spaces in Fig. 16 draw the inertia area *a*. Let A = total area. then moment of inertia $I = Aa = 16 \times 0{\cdot}64 =$ 10·24 ft. units, and $Z = \frac{I}{y} = \frac{10{\cdot}24}{1{\cdot}375} = 7{\cdot}44$. Ratio $\frac{W}{A} = \frac{112 \times 9\frac{1}{8}}{1} = 1{,}026$ lb. per square foot, and for a maximum stress of 3 tons per square foot, $\frac{W}{A} + \frac{M}{Z} = 3 \times 2{,}240$; $\frac{W}{A} = 1{,}026$, therefore $\frac{M}{Z} = 6{,}720 - 1{,}026 = 5{,}694$, whence $M = 5{,}694 \times 7{\cdot}44 = 42{,}363$ lb.-ft. The leverage of the wind pressure $= \frac{9{\cdot}16}{2} =$ 4·58 ft., therefore $\frac{42{,}363}{4{\cdot}58} = 9{,}249$ lb. total allowable pressure. Area of unit of wall = 20·75 × 9·16 = 190·2 sq. ft., giving the maximum wind pressure per square foot $= \frac{9{,}249}{190{\cdot}2} = 48{\cdot}56$ lb. With this wind pressure the stress on the inner edge will be $\frac{W}{A} - \frac{M}{Z} = 1{,}026 - 5{,}694 = -4{,}668$ lb. or 2·085 tons per square foot tension, whence it appears that the maximum safe wind pressure is 48·56 lb. per square foot for a maximum compression of 3 tons per square foot and tension of 2 tons per square foot.

PANELLED WALLS.

Panelled walls, Figs. 18 and 19, may be desirable on account of appearance, but they involve extra labour, and their weight being reduced they have less stability, than a solid wall. They would be calculated at the base the same as a solid wall of the reduced weight, at the top of plinth in the same way, and at base of panel the same as a wall with buttresses and counterforts.

WALLS WITH SET-OFFS.

By making a series of set-offs on each side of a wall 30 ft. high, at heights of 7 ft. 6 in., about 20 per cent. may be saved in the bulk above ground line, as shown in Figs. 20 and 21, but the extra cost of blue brick weathering at each set-off must be added, together with the increased cost of wider foundations, to obtain the same life and stability, so that no ultimate saving would result from this form of section.

If the set-offs are all on one side of the wall the wall will be more stable than above with the wind on the plain face, and less stable with the wind on the set-off side, owing to the shifting of the centre of gravity.

FOUNDATIONS.

The ordinary concrete foundation under a wall consists of Portland cement concrete, 1 cement, 2 sand, 5 aggregate, projecting 6 in. on each side of bottom course of footings and 9 in. thick. The 6-in. projection arises from the allowance given in the excavation for the bricklayer to get at his work, and the thickness is settled upon no rule whatever. It is desirable that some general rule should be adopted, and the author suggests the method shown in Fig. 22. Approximately it may be taken as

Projection of concrete = ½ thickness of wall.
Depth concrete = thickness of wall.

HOUSE WALLS.

Rondelet, a century ago, undertook a scientific investigation into the proper strength of house walls, and he based his calculations largely upon an examination of ancient Roman walls which had withstood the storms of eight or ten centuries. Among these, the walls of Hadrian's Palace at Tivoli had a thickness of one-sixteenth their height, and that, Professor Unwin states, is not widely different from the thickness which would now be required in strong and lofty buildings. Gwilt gives a formula for the thickness of brick walls as follows:—

$$T = \frac{HL}{ND} \quad \ldots\ldots\ldots\ldots \quad (23)$$

where T = thickness in feet, H = height in feet, L = length between party or cross walls in feet, D = diagonal of length of wall by scaling of $\sqrt{H^2 + L^2}$, N = constant = 22 for dwelling-houses, 20 for warehouses, 18 for public buildings, increased to 27, 23, and 20 respectively when H is less than ½L. Rubble stone walls to be ⅓ thicker than those of brick

His rules for modern use can be put into a formula as follows:—

$$t = \frac{Lc}{\sqrt{L^2 + H^2}} \quad \ldots\ldots\ldots \quad (24)$$

where *t* = thickness of wall in feet, H = height in feet, L = length of wall in feet, *c* = constant = $\frac{H}{12}$ for warehouses, and $\frac{H}{20}$ for dwelling-houses. Graphically it may be worked as shown in Fig. 23.

According to Mitchell's "Brickwork and Masonry" (second edition, p. 195) it has been stated by an "eminent authority" that he should consider a wall overhanging 1 in 24 not unsafe, and dangerous when it overhangs 1 in 12; but from the principles which have been placed before you this evening, it is clear that any statement of this kind is irrational, unless made in connexion with a wall of a given height and thickness, as the stability will be affected by both these dimensions when the rate of overhang is constant.

The author has now shown that there is much more in the question of the stability of simple walls than the members of this society were probably aware of, but he trusts that while he has given the material for a full consideration of the subject, he has reduced the matter to the utmost simplicity for practical use, by suggesting that plain fence walls should have a minimum thickness of one-ninth of their height."

Mr. Ellis Marsland proposed a vote of thanks to the lecturer, remarking that he had never realised the vast amount of trouble and difficulty and the risk involved in building a wall. He confessed he had never taken the trouble in the matter in the way the lecturer had done, but at the same time he had had no accident.

Mr. H. Lovegrove, in seconding the motion, remarked on the necessity of calculating wind pressure in the case of a market which, some years ago, he had to design. He had a great deal of difficulty in the Highbury New Park and the Highbury Crescent district, where the foundations were clay. There had been several difficulties with the Congregational church, which was designed by Mr. Solomon, and one theory advanced, which he did not think improbable, was that the moisture was passing away to lower ground. He saw a corrugated wall bounding a beautiful garden in London not long since which was only half a brick in thickness, and which had stood for forty years and was almost perfect. Panelled walls he considered an abomination, and he did not think any practical man would build walls with set-offs, for unless they made a very perfect set-off there was always danger.

Mr. Waldron warned those who were proposing to put granite in walls to be careful to see they got the granite they specified, for granite weathered in an extraordinary way, and he had known it cut in Cornwall with an axe. He saw from a recent publication of the tests of wind pressure made on the Forth Bridge, both on the anemometer and on large boards, that whilst 28 lb. to 30 lb. was as much wind pressure as any ordinary person would want to calculate for, yet it had been suggested that, as wind pressure was liable to gusts, the pressure allowed should be doubled and brought back to the old Board of Trade regulation of 56 lb. It appeared to him that this would result in great waste.

Mr. Margary said a great many architects designed pierced walls in the case of ornamental gardens, and he had in his mind a particularly beautiful example at Edenbridge which was 4½ in. thick, had buttresses about 9 ft. apart, and was about 6 ft. high. For artistic purposes he thought it was necessary generally to go beyond the absolute requirements of theory. For instance, if they built a chimney-stack with fireplaces on each floor they could theoretically limit the size and thickness of the breast, but such a limit would not be artistic. There was no doubt they had to use more materials than were absolutely necessary if they would make their buildings artistic.

The Chairman said it was quite true that they should take the point where the fracture commenced, but that was the point which one had difficulty in obtaining satisfactory information about. One could find out what was the crushing resistance of different materials, but there was a little practical difficulty about where the fracture commenced. However careful they might be in theory they had always to contend with the carelessness of the workmen. A striking example of that was furnished at the last meeting of the Architectural Association, when it was stated that, on the occasion of tests being made on piers, the workmen, who were only left unsupervised for an hour, did not put the bonding in properly, with the result that the pier failed to stand the

expected load. It was that sort of thing which upset theory. It was new to him to hear that the small pilaster had no value, as he had taken it for granted that small buttresses would strengthen in a way. It showed in another way how right their forefathers were in Gothic times. They found that the buttresses in any old church projected considerably, but the buttresses of modern churches were very often nothing at all.

Mr. Adams, replying to the vote of thanks, remarked that the difficulty of corrugated walls was that landowners wanted straight dividing lines between property. In the case of wind tests taken by the anemometer, it often happened that a gust of wind went against the anemometer, but where it was the case of a large surface this got both the hit and the miss. Pierced walls offered less surface to the wind; but in the case of lattice girder bridges it was the rule to allow about one and a half times the actual exposed surface. His figures were based on fracture points in almost every case.

THE SURVEYORS' INSTITUTION.

THE following is Mr. H. T. Scoble's reply to the discussion at the Surveyors' Institution meeting on his paper on "The Administrative Aspect of Sewage Disposal." Some notes of the discussion appeared in our last issue.

"In replying to the discussion, I propose, firstly, to deal with several of the more important matters raised; and, secondly, to refer to the chief criticisms. The contention that some definite change in the want of system on the one hand and the existing system on the other in administrative affairs is urgently demanded, has been supported by most speakers; in the larger matters there is no control because there is no responsible authority, and in what, comparatively speaking, might be termed details, there are (for England) regulations that make neither for efficiency nor for economy.

Mr. Roechling voiced his objection to the establishment of a central authority, acting in an advisory or consulting capacity and being invested at the same time with quasi-judicial powers. Mr. Middleton said that some appeal from the central authority would be necessary. I understand from the proposals of the Commission that the functions of the central authority would be far more judicial than advisory, and, though at first sight it would appear desirable that appeal should lie to some higher tribunal, I am by no means sure that, in the long run, this would be of advantage. After all, the important matter is that some authority should be charged with the duty of freeing our rivers from pollution, and it is essential not only that the authority be technically qualified for the various duties that would have to be undertaken, but also that the fullest opportunity be given for the collection and collation of information. Mr. Martin's suggestion for the appointment of a Minister of Public Health deserves very careful consideration. As far as I can see at present, such a Board of Public Health would form an admirable head for a department dealing with rivers pollution and cognate matters.

It is evident, from the many allusions made at the meeting and from references to opinions expressed eleswhere, that a strong feeling of sympathy exists with those county and county borough councils who have done, and are still doing, so much good work in connexion with sewage disposal, etc. It appears to me that there is some misapprehension as to the scope and powers of the proposed rivers boards. As detailed in my paper the existing conservancy and rivers boards are composed in the main of members elected by county and county borough councils, and my object in preparing Schedule III. was to show, in conjunction with the map, that these councils would be concerned with the proposed rivers boards. Surely no ill-feeling can arise in any district where the work which has been carried out by a county council in its own area is extended over the whole catchment basin, for the county council itself and the county boroughs therein will be represented on the new Board. As regards the medical officers of health, who have done such excellent pioneer work as has been accomplished in several counties (alas! that it should be in so few), I can conceive no persons better qualified to act as chief inspectors to the rivers boards, and these, it should be noted, will cover large areas. I think Mr. Middleton, in referring to the subject of voting for the election of rivers boards, must have forgotten for the moment that these bodies are formed from the members of the county councils.

It is with some diffidence that I mention the question of supervision of water supply, as considerable opposition has been manifested to any pronouncement by the Royal Commission on Sewage Disposal on a subject not specifically referred to them. As I read the proposals there is nothing to conflict with existing rights, and the supervision of the present sources of supply, which are undoubtedly subject to potentially dangerous contamination, can hardly be objected to on public grounds. It is admitted that the collection of information respecting water supplies is an urgent necessity, and it would be well that a transference of water from one catchment basin to another should be regarded as a matter of national concern. Rivers boards and the central authority could obtain all data required, and the latter body would in due course be in a position to deal with the larger questions involved in a far-seeing manner.

Mr. Cowper Coles drew attention to the Salmon and Freshwater Fisheries Act of 1907, and to the Acts for the Wye and the Usk, and at the conclusion of his remarks expressed the belief that much would be done to prevent pollution under such local Acts. I hope it may be so, but venture to remind him that without further powers it will be no easy matter to prove pollution. As an instance of the difficulties involved I would draw attention to an action taken in 1884 by the Conservators of the River Lee against the Corporation of Hertford in the High Court, Chancery Division, which was dismissed with costs amounting to over 6,000*l*. The judge, the late Mr. Justice Watkin Williams, visited the site in question and made notes and delivered judgment as follows:—"Manifold ditch—a broad black ditch—water in ditch appeared very foul to the eye—peculiar dark blue shade of colour in the water and very marked smell of sewer gas—followed ditch through meadows—ditch very foul and filthy, with strong odour of sewage—from this point to aqueduct of New River, sides and bottom of the channel covered with a foul and filthy-looking growth—unmistakable odour of sewage. I believe my nose appreciated the smell all the way until I got my nose into the culvert on by the sewage works—it seemed to me I followed it just as a foxhound follows the scent of a fox, right up there." Judgment:—"I find that no real injury, pollution, or nuisance has been caused by the Corporation to the waters of the Lee." (R.C.S.D., R. IV., V. II., p. 130.)

Mr. Bowes spoke about the purification of effluents which will subsequently form part of a supply of drinking water, and stated that "it appeared to be suggested in the paper that the local authorities should bear the extra expense." This is contrary to the views I have held and expressed for some time past, and though the point was not specifically dealt with in my paper, yet I find the following remark:—"For the purity of water, those supplying it should, in my opinion, be responsible." On pages 217 to 220 of the Fifth Report, the Commission deal with standards for sewage effluents, and their view does not differ from the one I expressed.

Mr. Bowes and Mr. Williams both questioned the advisability of growing vegetables for human consumption, and grasses and roots for cows, on sewage farms. This is very largely an agricultural question, and as far as my information goes there is no direct injury to the crops, unless they are over-manured or receive too much water. I understand that in France the cultivation of fruit and vegetables intended to be eaten uncooked is forbidden where cesspool manure or sewage is employed, and the Local Government Board have objected to the growth of strawberries on a sewage farm. Apart from these considerations, however, it may be questioned whether the devotion of certain areas to special crops would not, generally, withdraw too much land for what might be termed "routine irrigation," with the result that the sewage would be inadequately treated.

Mr. Middleton touched on navigation, and Mr. Grantham on flood prevention. In some catchment basins it may be possible to have boards that could deal with these matters also, but where this could not be arranged and the interests involved are very extensive, they might be specially represented on the Board. I purposely avoided any definite suggestion for the constitution of rivers boards, as will be seen from the remarks.

Schedule II. was inserted to show the principal river basins according to the area of the catchment basin; some system of selection was necessary, and this occurred to me to be the most useful.

In stating that the Commission did not deal with the disposal of sewage into tidal waters and the sea, I had not lost sight of that section of the Report and of Appendix VI. on the Pollution of Estuaries and Tidal Waters.

Mr. Cyril Smith referred to the self-purification of rivers as being completed six miles from the point of contamination. This may or may not be so; there are so many forces to take into account that no hard-and-fast rule can be laid down. I might detail the investigations carried out by the Commission at Shrewsbury, where a 1 per cent. (volume) pollution of the Severn could be traced eighteen miles or more down-stream. I sincerely hope that no universal standard or standards of purity will be adopted, as what is desirable and easily to be attained in one case is in another neither required nor practicable.

I may remind Mr. Cotterell that, as stated in my paper, special regulations for the acceptance by local authorities of liquid trade wastes have been arranged for by Parliament, and that in Halifax an agreement between the manufacturers and the Corporation has been concluded. The duties of the rivers boards would in the main be supervision, and I hope with Mr. Cotterell that combinations of the smaller towns for joint works will be arranged.

Dr. Rideal drew attention to the time that elapsed between the Reports of an earlier Sewage Commission and the passing of the '75 and '76 Acts. It may be that public opinion was not ripe for the changes, and I hope that my paper and the discussion may help, in some measure, to assist in the purification of rivers, as no reforms can be expected until the failure of the existing laws and the defects of the present administration are more fully realised."

Examinations and Membership.

The Council of the Institution have decided that after the election of members, to be held in October, 1913, no Examination candidate shall be eligible for election as Professional Associate unless he has passed both the Intermediate and Final Examinations of the Institution. As a consequence of this change, after the present year candidates for the Intermediate Examination will be allowed to sit at the age of nineteen, and for the Final Examination on completing their twenty-first year.

DRAWING FROM THE LIFE, ITS VALUE TO ARCHITECTS.*

THIS title, I am afraid, suggests some cheap text-book on how to become an artist; but, if that be so, it should prove a very perfect subject for debate, inasmuch as text-books usually have a good deal of debatable matter within their covers.

At the outset it would be well to ask ourselves four questions. First: Is it necessary for an architect to be able to draw? There can, I think, be but one answer to that. Second: Is drawing possible without much practice? This again requires no discussion. If we agree, then, that drawing is necessary for an architect, and that drawing can only be acquired by continual practice, the next question is: What advantage can be gained from it? It is evident a man will gain power to express his thoughts by cultivating this means of expression instead of being confined to the language of words, and by facility of drawing attained through continual practice, he will be able to present his visions in shapes, which are then transmitted inversely through the eye to the mind. This should be the essence of all art training. The vision verified. Then why should an architect draw from the life? This question requires a fuller answer, and the difficulty arises as to where to make a start.

To begin with, the work of an architect, like that of all other creative artists, is necessarily founded on natural laws, equilibrium, structure, and fitness; naturally, then, a study of the human figure, which is the synthesis of all creation, must be useful, for in this form there is perfect balance, beauty of line, proportion, and construction.

In the human figure there are all the constituents of a building, and the knowledge gained by the study of its answer to immediate needs must prove to be a powerful incentive, and will ultimately exercise an enduring influence on the mind and taste of the student.

Unfortunately the modern idea of achievement is too often not in the quality of the work done, but in the price gained for it; the most anxious striving is to possess, the most admired of all achievements is to have gained wealth. Now this study from the life will not prove immediately marketable, nor indeed will it prove immediately helpful to a career in a money-making way; but if eventually it stimulates the imagination, as I firmly believe it will, and enlarges the powers of observation and attainment, thus producing work of a much higher standard, there can be no doubt that it will materially improve the financial as well as the artistic side of a man's career.

Let us now consider figure drawing from the point of view of its value to the architect. In my opinion, the main object of the architect in drawing from the life should be to draw in such a way that the analysis of form and proportion is his principal object.

For instance, an architect would not, at the commencement, think of drawing the details of any ornament or adornments, which he will ultimately place upon any building; similarly when drawing from the life he must get the structure of the figure well set-up before elaborating the niceties and detail; in fact, it is essential that all drawing should be kept in a purely structural form until a mastery has been achieved in setting up a figure in this way. This leads eventually to any elaboration of the drawing being considered relatively and in much better proportion. It stands to reason that if a drawing is made where the nose, eyes, mouth, etc., are all elaborately drawn at the commencement before the human building to which they belong has been thoroughly constructed and understood, the mind unconsciously admits a resemblance and is less critical of the general proportions, which should go to build up the structural element. It would be absurd for an architect to draw carefully in detail the windows, door, etc., of a building before considering the building as a whole; they are naturally a part of it, and the mind must of necessity give them proper consideration, but the primary object is the building. By working in such a method therefore and employing such principles drawing from the life becomes useful in the training of an architect as necessarily any faculty which adjusts parts relatively and in due proportion must add to his power; naturally, too, the mind will be strengthened and materially benefited by working in the same groove and applying similar methods for the development of this same faculty in another branch of study.

Thus drawing from the life must be, not a mere interpretation on paper in an impressionistic manner of what is before one, but a *carefully reasoned and considered rendering* of the substance or solidity of the object, not so much anatomically as structurally. Archaic sculpture deals particularly with the severer lines of nature; Michelangelo's figures in the Sistine Chapel are more buoyant and are so solid they could almost be mistaken for sculpture. When drawing, therefore, imagine the figure before you to be so many rectangular or cylindrical shapes nicely poised and placed together and so forming a building, which is constructed with all the nicety and proportion of the human form. This will lead to a student noting the vertical, horizontal, and circular lines, and if these are rendered even more pronounced than they appear in nature, it will make clearer the design and happy contrast nature is always showing to the earnest and thorough student of her many wonders. The wonderful symmetry, delightful contrast and grand proportion of the human figure might then suggest to some mind capable of grasping possibilities of this nature, lines suitable and useful for design. As an example, try and imagine the sun at such an altitude that it projected a stong cast shadow of a man where the neck was lost and the head formed the dome, the shoulders forming the angles, with a curved line between supporting the dome, and the two arms as columns suddenly cut off by a strong horizontal line of some other object intervening for the base. This was not, I know, the origin of a domed building, but there is in this example some resemblance; and it is only possible for me to suggest, however absurdly, so as to provoke thought.

I have pointed out the necessity of making a drawing in such a way that the contrasts of line will be more evident than they may appear in nature so as to gain a better idea of these lines for the purpose of design. I do not wish, though, to introduce a method or style which is false to nature, as, for instance, "Nouveau Art"; this is a debased art; we must watch and study nature.

Let us now briefly consider the proportion of the human figure, and how it can be applied in architectural design. It is very evident how important proportion is in design, and I am convinced there is much for an architect to learn in the beautiful proportion of the human figure. If you only look at a figure standing perfectly upright and note the proportion as spaces of the head, body, and legs relatively to each other you will see immediately how desirable it is for an architect to study from the life. There are minor divisions of these main forms, and also variety in different individuals of these main proportions, which it is unnecessary for me to specify. Now, if we carefully study and compare these spaces it is very apparent how useful they can be made to an architect in his design, and it is quite unnecessary for me to enlarge on the possibilities there are in this subject.

For an architect only to draw from the life with the object of selecting and arranging poses suitable for the statues and adornments of any building, when a sculptor must of necessity be employed to do this work, is using the model in the wrong way; in fact losing entirely the particular aim of this work; but if in learning to draw he obtains sufficient knowledge to be able to direct and assist the sculptor in the design of any figures required to adorn his work, then and then only is the time to draw from the life with such a purpose. There would then be much greater unity in the whole design than is generally apparent in most of such combined work.

Architecture claims, and rightly, to be the highest form of art; but unless the mind is cultivated and perfected by great and mighty ideals, it only becomes one of the trades. The expression "merely a pot-boiler" is often heard in relation to painting; it might apply equally well to architecture. Many people do not appreciate or look upon architecture as being the highest form of art, simply because those whose works adorn our streets and country have been content with narrow and mercenary ideals. Architects say they must be business-like, but they forget there are many purely business men who have made their mark in finance by their wide and appreciative knowledge. An architect, therefore, ought to find it compatible with his business qualities to force the public to recognise the higher and sublimer aspect of his work.

To sum up, then, a study, which cultivates the sense of reasoning and analysis, which gives facility of drawing, which in its turn gives a greater power of expressing thought intelligently, a study which strengthens the faculty of seeing relatively proportion even to the smallest detail, must be useful. And these are not the only gains, for particular emphasis must be given to the proportion of the human figure and the importance of this subject in design. Then, again, the intelligence is quickened and the imagination is stimulated by seeing the laws and principles of equilibrium and structure so perfectly exemplified in nature's most perfect form.

The Architectural Association offers every facility for the continuous and thorough study of architecture, and there are so many scholarships given for its encouragement and advancement that it behoves all to make the most of these opportunities. Moreover, every effort should be made to take advantage of any study which will raise and elevate the mind and taste, whilst they are young and receptive, for in after years neglected opportunities will be regretted when pounds, shillings, and pence become of necessity the chief factor of existence.

* A paper read before the Architectural Association Debating Society, on Friday, January 15, by Mr E. Constable Alston.

THE CARPENTERS' COMPANY: REASON IN BUILDING.

THE Carpenters' Company, having in view the decadence of apprenticeships, has decided to give, in its Hall, a series of thirteen weekly lectures on preliminary design in the constructive arts, in accordance with its ancient tradition for the advancement of the best work in the arts connected with building. The lectures will, in the first place, be for all craftsmen, and those engaged in actual trades in connexion with the constructive arts, but all of either sex and of any trade or profession are invited to attend. Admission will be free by ticket, and the lectures will last about three-quarters of an hour, and at the close questions on them may be asked. At the end of the course prizes will be offered to those who have attended not less than eight lectures.

There will be six competitions. Four will be open solely to craftsmen and others who are actual workers in their respective trades, and who are not professionally engaged in any architect's or designer's office. The successful competitors, if called upon so to do, must satisfy the judges in this respect, and should any dispute occur the judges' decision will be final. Two of the competitions will be open to anyone, irrespective of their occupation.

Good design will receive more consideration than skill in draughtsmanship, *i.e.*, design

thoroughly appropriate for the material dealt with. Preference will be given to good working drawings. Though it is hoped the lectures will be more or less exhaustive, the idea is to encourage those who attend to study the subjects for themselves.

The first of the series was delivered on Wednesday last week, in Carpenters' Hall, London Wall, by Mr. R. Weir Schultz, whose subject was "Reason in Building; or the Commonsense Use of Materials."

The chair was occupied by the Master of the Company, Mr. Maurice H. Pocock, who, in introducing the lecturer, said he was glad to see a good audience. In the past the Carpenters' Company was responsible for the education of the whole of the craft in London, but that was no longer the case. It appeared that now the ancient idea of apprenticeship was dead, and the wish of the Company was to do what was possible in a voluntary way, and they started the lectures to try and get the craftsmen to understand and take an interest in design—simple design. The success of a building was dependent on the right use of every piece of work which constituted it, for if men could not be got to take an interest in individual pieces of work the building would not be a success, however fine the design. The lectures were not necessarily for architectural students; they were for craftsmen, and the object was to get men who did the work to take an interest in it, and to understand the design. A man working to a design when he understood something about it would be far more likely to take an intelligent interest in it. But although the lectures were for craftsmen, they were glad to see architectural students and others present.

Mr. Schultz, who will also deliver the two next lectures on the same subject, congratulated the Company on their foresight and enterprise in attempting to tackle the decay of apprenticeship and the crafts, and to try and mitigate some of the evils arising in consequence. He was convinced that the only really satisfactory training in the crafts must always be in the practical touch with everyday work. We heard a good deal about extending the age of leaving school. What would be the good of that? It seemed to be the idea now to divide education up by sharp subdivisions, *i.e.*, elementary education, secondary or technical education, and University education, and it appeared to be taken for granted that there was no such thing as education with a capital E outside schools and colleges. Assuming that the best results could be got only by contact with actual work, how could that be obtained under modern conditions of the crafts? It seemed to him that that must come through the crafts themselves, and their own organisations, and of those intimately associated with them. It was well that some of the old City guilds should show their interest in, and connexion with, the crafts, and he hoped that the result of the lectures would be to organise some scheme for dealing with matters more effectually. The trade unions had usurped some of the functions of the old guilds, and it was not impossible that they would take more and more interest in the education and knowledge of their members. The general opinion seemed to be that the apprenticeship system was doomed, and might soon become a thing of the past, as it had practically in most trades, at least in its old form; and one was tempted to ask what the community was trying to put in its place, and whether the substitute was likely to be effective? In the technical and advanced technical schools, fitted up with expensive machinery at the expense of the ratepayers, who might one day object to such expenditure, the young craftsman found everything to hand, and started work under what looked to be most favourable circumstances. He was inclined to think that the tendency was to make things too easy for these young people, for when they came to take their place in the battle of life they might be found wanting in many things, such as resourcefulness.

In the best schools there was an attempt to guard against this, but who were the people engaged in training these pupils? At the beginning of the movement practical craftsmen were engaged, but now their places were being taken by school-trained masters, who had little acquaintance with workshop routine. Where they were once engaged in the craft they were now getting out of touch with the workers, becoming more of the master and less of the craftsman. There were three systems of technical schools in London, *i.e.*, the day school system, in a more or less experimental stage, from which it was hoped good trained men would come, but in regard to which there was no guarantee of continuity of attendance, for the parents often took the children away in order that they might earn money just at the time when they were getting on and the education was becoming of use to them; the second system was one in which, by arrangement with the employer, boys engaged in actual trade work were allowed to leave their work earlier in the afternoon than would otherwise be the case in order to put in more time at school—it was a sort of continuation system, and there was hope for that too; the third system was that of the night school, which had, perhaps, developed most; but in his opinion it was likely to be the least satisfactory eventually. There were obvious disadvantages, such as the tendency to overwork the students, for the hours of study or work at night were hard on a boy, and unfitted him for his daily work, and one could not wonder that employers often objected to boys attending such classes. On the other hand, the properly-equipped school had many attractions for a boy.

There were various ways of gaining experience of the useful sort, such as (1) By the study of the methods of the old builders, as exemplified in their works; (2) by contact with and learning from the older generation of craftsmen now rapidly disappearing; and (3) by keeping ones eyes open and learning and profiting from mistakes. The old craftsmen were brought up on a traditional system of apprenticeship going back very far, a system where established method and custom was handed down as a matter of course, and where every proposed change was well considered before it became part of the system. In most towns, especially the large modern ones, few of the old trades obtained; machinery had revolutionised nearly all the methods in most of the trades, and its true place in relation to the crafts had not yet been definitely established. One must look forward to the time when machinery would be the handmaid of the crafts—not craftsmen the slaves of the machine. There was hope in the development of the system of the easy distribution of electric power, which, by making possible the use of small detached motors, would tend to the breaking up of large factories and the establishment of small workshops under favourable conditions.

It was surprising what could be learnt from an intelligent attempt at getting to know the reason of doing things as the old men did them. Their conditions differed from ours, and what was all right when they did it might be all wrong now, but such a study was bound to be productive of good. But they should not do as young architectural students of the last thirty years had been doing, *i.e.*, make pretty superficial sketches or measured drawings to scale; the latter were valuable as study and records, but they did not help one far along the way one wanted to go, *i.e.*, to learn how to build honestly, efficiently, and beautifully. The old men were human and not infallible. They tried experiments occasionally, both in composition and construction, and they sometimes overstepped the mark.

As to learning from one's own experience and profiting from mistakes, he emphasised the value of direct responsibility. A young man might work for years making diagrams to be carried out by others, and he might think he knew a good deal about things in general, but give him a piece of real work to do in which he had to take the whole and final responsibility, and he would soon find out how little he really knew, and would really begin to learn.

Viollet-le-Duc, in his most excellent article on "Construction," in his "Dictionary of Architecture," said: "Architectural construction is the employment of materials according to their quality and their adaptability with the idea of satisfying a want by the most simple and solid means, giving to the constructed object the appearance of durability and proper proportion, subject to certain rules imposed by the senses—reason and human instinct." Those were points he wished to emphasise, *i.e.*, that all good building must show proportion, durability, and reason. It might have nothing about it which might be called architecture, as that was considered nowadays, but it was probably more likely to be classed as good architecture than the bulk of the structures going up at the present time. A good deal of nonsense was talked to-day about the difference between building and architecture. In his opinion there was little chance of seeing really good living architecture until architects of the general type that are turned out to-day ceased to exist. Good architecture could grow only out of reasonable building, and reasonable building could come only from a sound constructive basis and a real knowledge of materials, their uses and limitations. New methods of construction were very much to the fore, and these, when properly assimilated, would form the basis from which a sensible, straightforward, new building tradition might develop—a tradition which would incorporate all that was best for modern requirements from old methods. Viollet-le-Duc said that "the methods of the constructor must vary according to the nature of materials, the means at his disposal, the requirements he must satisfy, and the civilisation amidst which he is placed." This put the matter in a nutshell.

In the old days the materials on the spot were those generally employed, and hence a building grew up indigenous to a district, and, one might almost say, represented the civilisation of that district. In a stone country buildings were almost invariably of stone, and in another timber construction would prevail. Now, however, owing to facilities of transit and the increase of large manufactories, it was often cheaper to build with materials brought from a distance rather than with those close at hand. Reasonable cheapness in building was an economic necessity, for in most cases it meant the difference between profit and loss, but the commonsense of the matter was to adhere to the general type of the district, and not to use materials which would jar. For instance, a red brick house, covered with Welsh slates, would be out of place in the Cotswold district.

The lecturer then dealt with various details of construction, and having referred to the unreasonableness of some of the building by-laws in country districts, he showed some lantern illustrations of suitable types of construction.

A vote of thanks was accorded to Mr Schultz, and the proceedings terminated.

WEAVING-SHED, ECCLESTON.—A weaving-shed has been erected by the Eccleston Mill Company at Eccleston Green. The contractors for the work were as follows:—Buildings, Mr. John Tomlinson, Leyland; engines, Messrs. C. Whittaker & Co., Haslingden and Accrington; looms, Messrs. Willan & Mills, Blackburn; preparatory machinery, Mr. Henry Livesey, Blackburn; shafting and ironwork, Messrs. H. J. & A. Colthurst, Darwen; economiser, Messrs. E. Green & Son, Manchester; boiler, Messrs. J. Foster & Son, Preston; and the architects, Messrs. J. B. & W. Thornley, Wigan, Darwen, and London. The premises are lighted by the Keith high-pressure system, installed by Mr. T. Barton, Electric Works, Blackburn.

THE BUILDER

JANUARY 23, 1909.

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MEETINGS.

FRIDAY, JANUARY 22.

Architectural Association.—Mr. J. H. Markham on "Reinforced Concrete." 7.30 p.m.

Birmingham Architectural Association.—Mr. Arthur S. Dixon, M.A., on "Early Roman Churches."

The Royal Sanitary Institute.—At the Manchester Royal Infirmary. 2.30 p.m. Discussion, in the Municipal School of Technology, on "The Manchester Royal Infirmary from the Hygienic, Sanatory, and Æsthetic Points of View," to be opened by Mr. Edwin T. Hall, followed by Mr. John Brooke. 7 p.m.

SATURDAY, JANUARY 23.

Royal Institution.—Professor Sir Hubert von Herkomer, R.A., on "The Critical Faculty."—I. 3 p.m.

MONDAY, JANUARY 25.

Polytechnic, Regent-street.—Lecture, with Illustrations and Practical Demonstrations, on "The Technology of Decorative and Protective Paints, with Special Reference to Zinc Paints," by Mr. J. Cruickshank Smith, B.Sc., F.C.S. 8.30 p.m.

University of London (South Kensington, S.W.).—Mr. Banister Fletcher on "The Belgian and Dutch Renaissance," illustrated. 8 p.m.

Royal Society of Arts (Cantor Lecture).—"The Public Supply of Electric Power in the United Kingdom," by Mr. G. L. Addenbrooke, M.I.E.E. (Lecture II.) 8 p.m.

TUESDAY, JANUARY 26.

University of London (South Kensington).—Mr. Percival Gaskell, R.B.A., on "French Painters."—III. 3 p.m. and 8 p.m.

Institution of Civil Engineers.—Papers to be further discussed—(1) "High Speed on Railway-Curves," by Mr. J. W. Spiller. (2) "A Practical Method for the Improvement of Existing Railway-Curves," by Mr. W. H. Shortt. 8 p.m.

WEDNESDAY, JANUARY 27.

Carpenters' Company, Carpenters' Hall, London Wall (Lectures on Arts Connected with Building).—Mr. R. Weir Schultz on "Reason in Building, or the Commonsense Use of Materials."—III. 7.30 p.m.

Institution of Civil Engineers.—Students' visit to Blackfriars Bridge, to inspect the erection of girders.

THURSDAY, JANUARY 28.

The Royal Institution.—Professor J. Oliver Arnold on "Mysteries of Metals."—II. 3 p.m.

Architectural Association Camera and Sketching Club.—Annual General Meeting.

Institution of Electrical Engineers.—Dr. E. Rosenberg on "The Parallel Operation of Alternators." 8 p.m.

Manchester Society of Architects (16, St. Mary's Parsonage).—Mr. Arthur T. Bolton on "The Dome as the Basis of an Architectural System."

FRIDAY, JANUARY 29.

Glasgow Architectural Craftsmen's Society.—Mr. F. A. MacDonald, C.E., on "Reinforced Concrete—its Requirements and its Application." 8 p.m.

Architectural Association Debating Society.—Mr. H. J. Leaning, F.S.I., on "Approximate Estimating." 7.30 p.m.

SATURDAY, JANUARY 30.

The Royal Institution.—Professor Sir H. von Herkomer on "Sight and Seeing." 3 p.m.

Fifty Years Ago.

FROM THE *Builder* OF JANUARY 22, 1859.

THE DECLINE OF THE LONDON STREET.

IT is curious to trace the decline of streets where, in Queen Anne's days, fashion and rank gladly took shelter. The first step in decline is generally the announcement that some professional gentleman has removed or commenced business; then some public institution is opened. On this the more aristocratic of the inhabitants move away, and in course of time the street is entirely occupied by various establishments. After this a fancy stationer, or silk mercer, and other dealers begin to fill windows with their goods. On this the higher class of professional men look for fresh quarters. The ordinary house windows are made into small and second-rate shop-fronts, some of which are occupied by dairymen and beer-shop keepers; then certain of the houses are let in tenements, and rows of bell-pulls, some of them with small brass plates below, show that the dignity of the street is still kept up by persons who can each afford to rent a set of apartments. The decline still continues; the shops become occupied by small dealers in general stores; from some, perhaps, a barber's pole is ventured forth; the bell-pulls gradually disappear, and a dense population, in most cases families living in single rooms, take possession of the street. This gradual succession of one rank after the other, and the desire as much as possible to imitate those just a step above, are the result of a natural, and in some degree commendable feeling; but it is attended with ill consequences in a sanitary point of view; for, as we have often before observed, those dwellings were not intended to be occupied by a multitude of families, and in the majority of instances the landlords take little care to improve them.

*** We see at this day the permanent results of this kind of transformation of streets and squares which in the above paragraph is described as in process of operation.—ED.

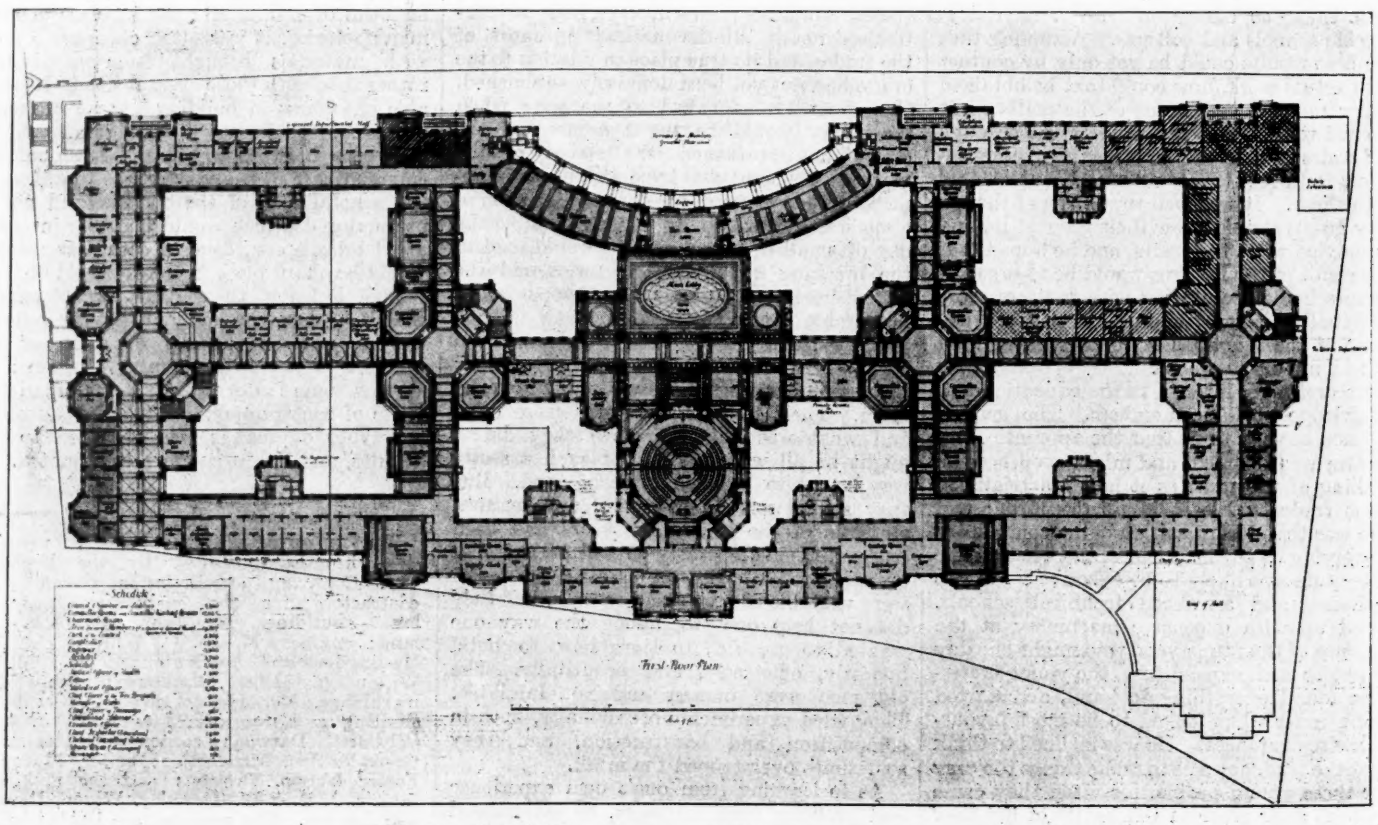
Illustrations.

REREDOS BY THE LATE G. F. BODLEY, R.A.

THIS is an illustration from a drawing left by the late Mr. Bodley for a reredos in Holy Trinity Church, Kensington Gore, which, as mentioned under "Notes," it is now proposed to carry out in the church as a memorial to him.

COUNTY HALL COMPETITION.

THE design here illustrated was submitted in the first competition by Professor C. H. Reilly, of Liverpool.



Competition Design for London County Hall. Plan.

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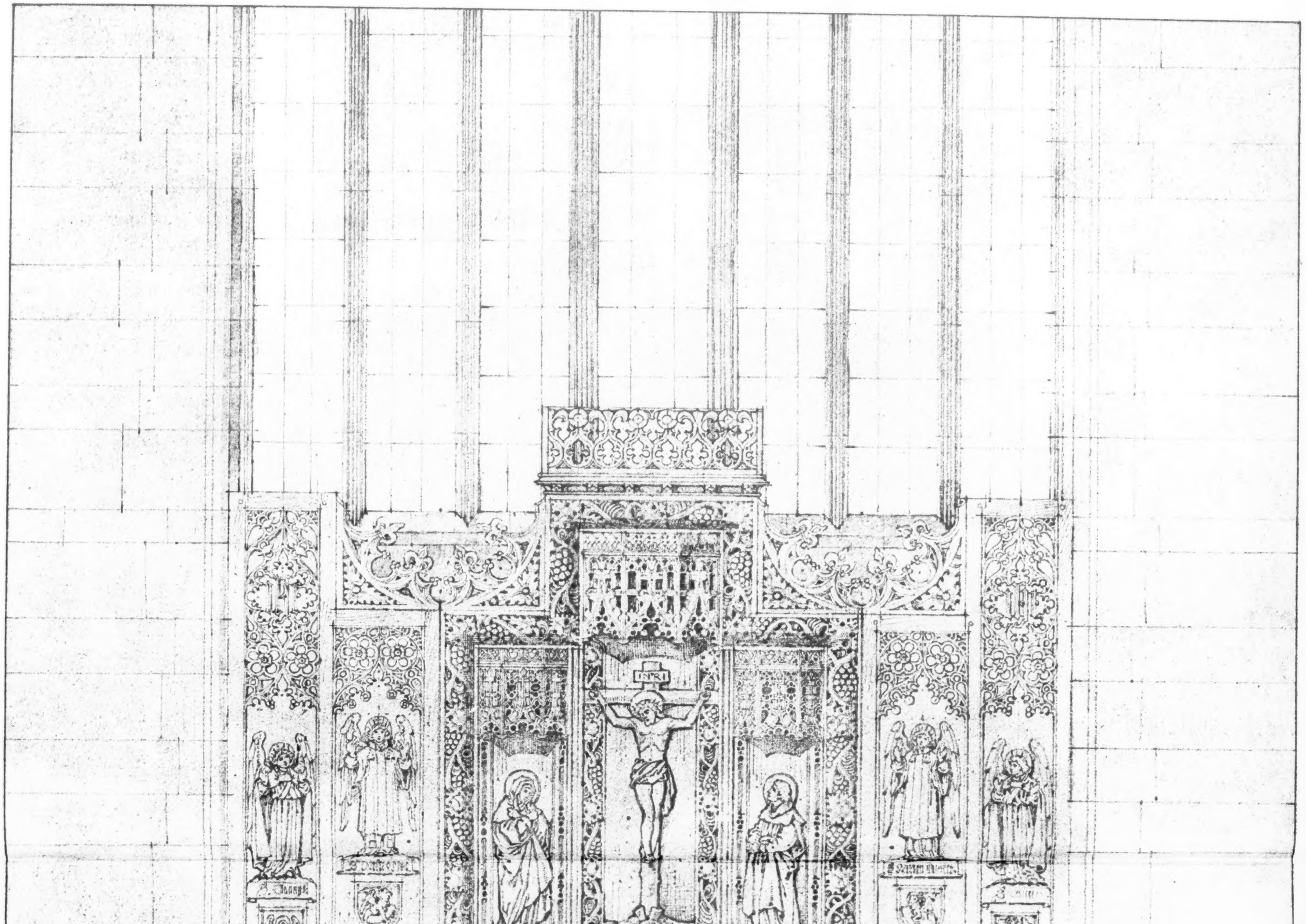
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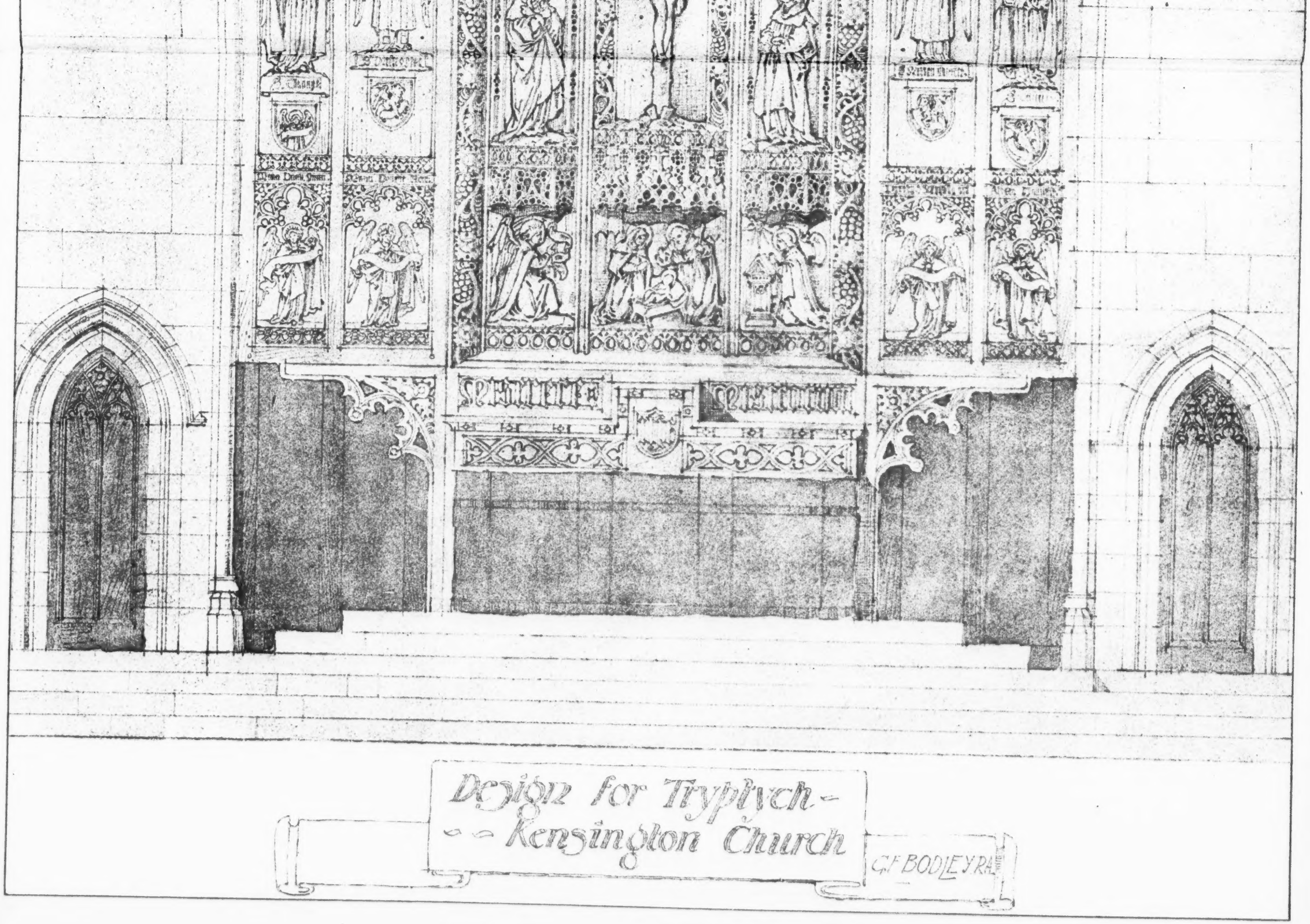

REREDOS DESIGNED BY THE LATE G. F. BODLEY, R.A.

PROPOSED TO BE ERECTED IN HOLY TRINITY CHURCH, KENSINGTON GORE, AS A MEMORIAL TO HIM.

COMPETITION DESIGN FOR LONDON COUNTY HALL.—

N COUNTY HALL.—By Mr. Charles H. Reilly, A.R.I.B.A

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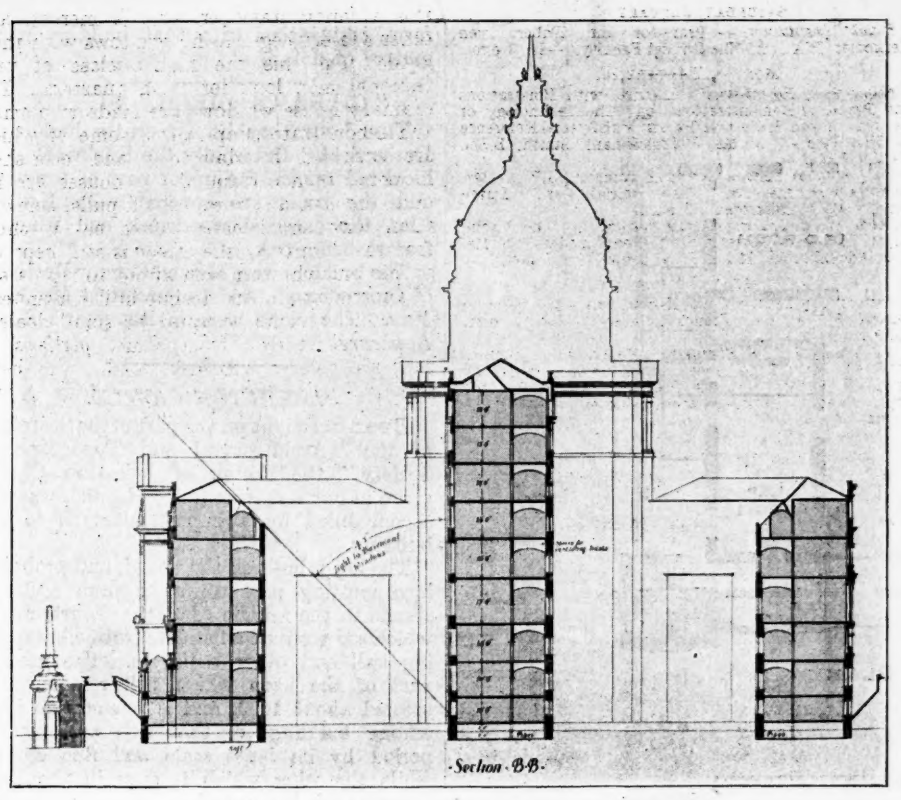


Competition Design for London County Hall. Section.

The main idea underlying this scheme was that of a building of three parallel blocks facing the river in which the centre block was raised very considerably above the other two. The object of this was in the first place to attempt to give the impressive effect of a building rising tier upon tier from the river; and secondly, by keeping the outer buildings moderately low, to ensure a good angle of light to the central block. It will be seen from the cross-section that in this way an angle of 45 deg. of light was preserved to all rooms, including the basement. A further reason for this treatment was that the breaking up of the building into two levels made it possible to use orders and entablatures of a moderate size, and it was hoped that what was lost in scale of the parts would be gained in the apparent size of the whole building. The author now feels that this was to a certain extent a mistake.

Similarly with regard to the domes, a central feature sufficiently large to command so long a site was thought to be expensive and impractical, and that two domes such as Greenwich possesses would, after all, give a more monumental effect; it did not, he must confess, occur to him that a composition of chimney-stacks and a small domestic cupola would be really adequate to the occasion.

With regard to the plan, the departments were massed together both vertically and horizontally as much as possible, and in the central ridge of building only those departments were placed which could be completely housed therein. The accommodation for members of the Council was, in the absence of instructions, arranged as a club, in rooms forming a crescent to the river, where they could not be overlooked. The committee-rooms were placed in the two cross corridors midway between the Chamber and the departments. The four octagonal staircase halls on each floor would, it was thought, make for ease in finding one's way about the building.

THREE INDIAN BUILDINGS.

THESE designs, published with the consent of the Government of India, are by Mr. James Ransome, late Consulting Architect to that Government.

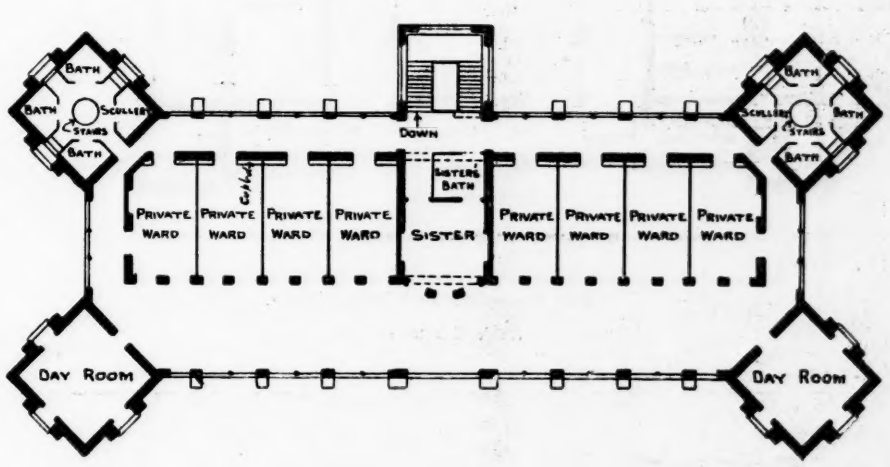
Conditions influencing the design of buildings in India, and the objections to any faithful reproduction of either European or native styles in that country, were dealt with in detail by Mr. Ransome in his paper, "European Architecture in India," read before the Royal Institute of British Architects in January, 1905; and these designs are intended to illustrate the opportunities afforded by such conditions for entirely original work.

The huge block of offices now in course of completion at Dacca, the Capital of the new province of Eastern Bengal and Assam, is of plastered masonry upon a plinth of unplastered red brickwork. Beyond a suggestion of the Byzantine in the grouping and arrangement of its main features, the design bears no stamp of any recognised style. Absence of all exterior detail is due to the necessity for annual coats of whitewash, and the wide projections of the flat roofs are for the protection of the plastered faces from the action of rain, and for screening from the sun the walls and clearstory openings introduced between the eaves corbels. The high veranda openings on the ground floor would not, in ordinary circumstances, be permissible in India; but in this building, with the exception of those facing north, the ground floor rooms are for the accommodation of records.

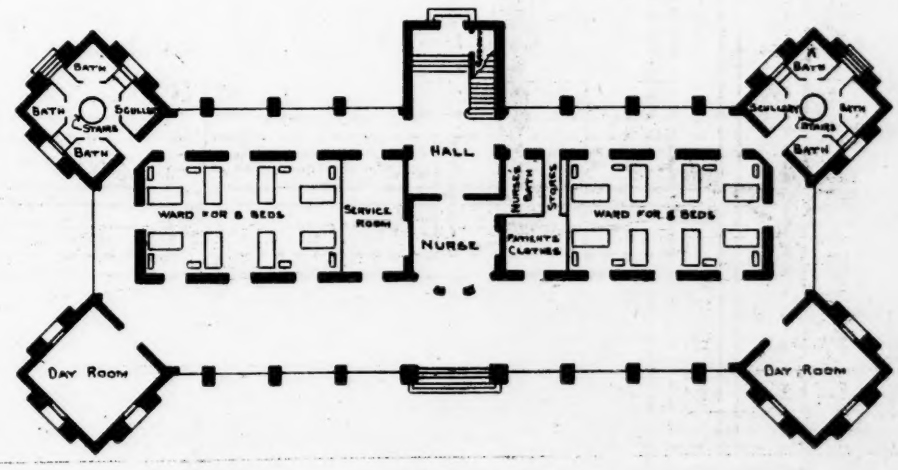
The external treatment of the sanatorium at Puri is on somewhat similar lines; but in this building the ground floor veranda openings are low, and the piers, between the arches, built in the form of buttresses, an arrangement admitting of increased width of opening without detriment to an appearance of stability. Situated on the east coast some 250 miles south of Calcutta, Puri is rapidly achieving popularity as a health resort from that city. The sanatorium stands on a broad stretch of sands facing the Bay of Bengal.

The Consulate at Ahwaz is Indian only in the sense of its being built by the Government of India. Building conditions in the vicinity of the Persian Gulf differ somewhat from those obtaining in India, where the arrangement of living rooms around an open courtyard is unusual, and "sardabs," or rooms below the level of the ground, obsolete. The Consulate faces the river, and, while differing entirely from the Puri Sanatorium as regards

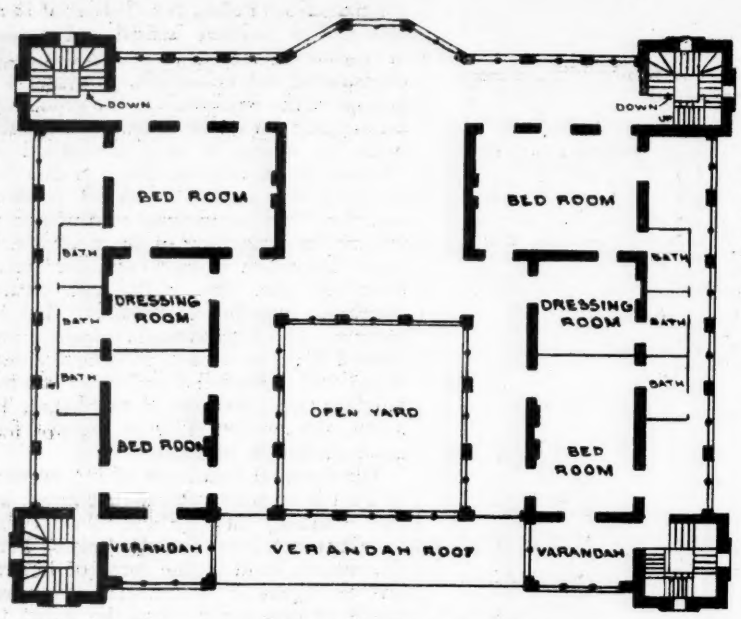
FIRST FLOOR PLAN



GROUND FLOOR PLAN



Sanatorium, at Puri.
(Scale 36 ft. to an inch.)



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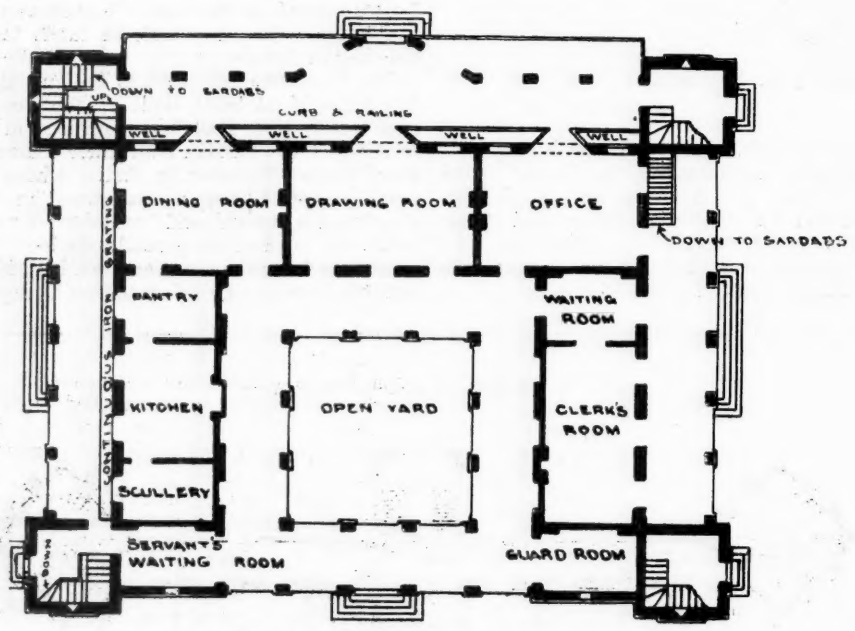


GROUND FLOOR PLAN

New Consulate Buildings, Ahwaz.

(Scale 32 ft. to an inch.)

form, is identical with that building in the matter of detail.

"GILHAM'S BIRCH," SUSSEX.

THIS house has been recently built near Rotherfield. Externally the brickwork is of local red bricks, the upper part of the walls and the roofs are covered with Kentish tiles, the external woodwork and window-frames being oak.

The builders were Messrs. Connor Brothers, of Crowborough, and the architect Mr. E. J. May. The views were in last year's Royal Academy.

ASKEATON CASTLE.

BY an oversight on the part of the Secretary of the "Architectural and Topographical Society," the sketch of Askeaton Castle, given in our last issue (page 61 *ante*), was not accompanied by any particulars as to the building.

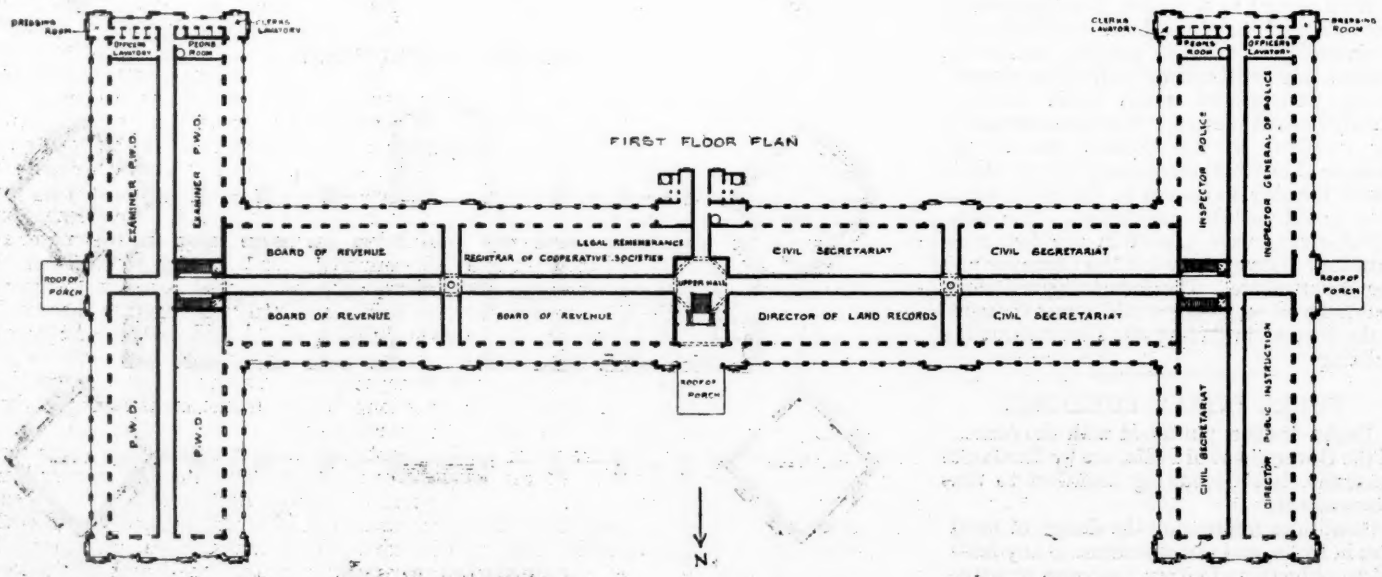
The keep, built on the site of, and probably incorporating part of, a Norman fortress, stands in the middle of a large court, round which are grouped a fine late Gothic banqueting hall and other buildings. The greater part of the keep which still remains was erected about 1400, and is remarkable even among buildings of that rich and prolific period by its large scale and fine detail; while the wing which is seen in the view surmounted by a tall chimney shows an exquisite example of the latest Gothic art, still untouched by any foreign influence, in the fireplace of the great hall on the top story, of the late XVIth century. The fortress was dismantled and half of the keep demolished during the Elizabethan wars; and though now kept in substantial repair by the Board of Works it retains but a shadow of its former splendour.

THE ARCHITECTURAL ASSOCIATION SPRING VISITS:

I.—THE SELFRIDGE STORE, OXFORD-STREET, W.

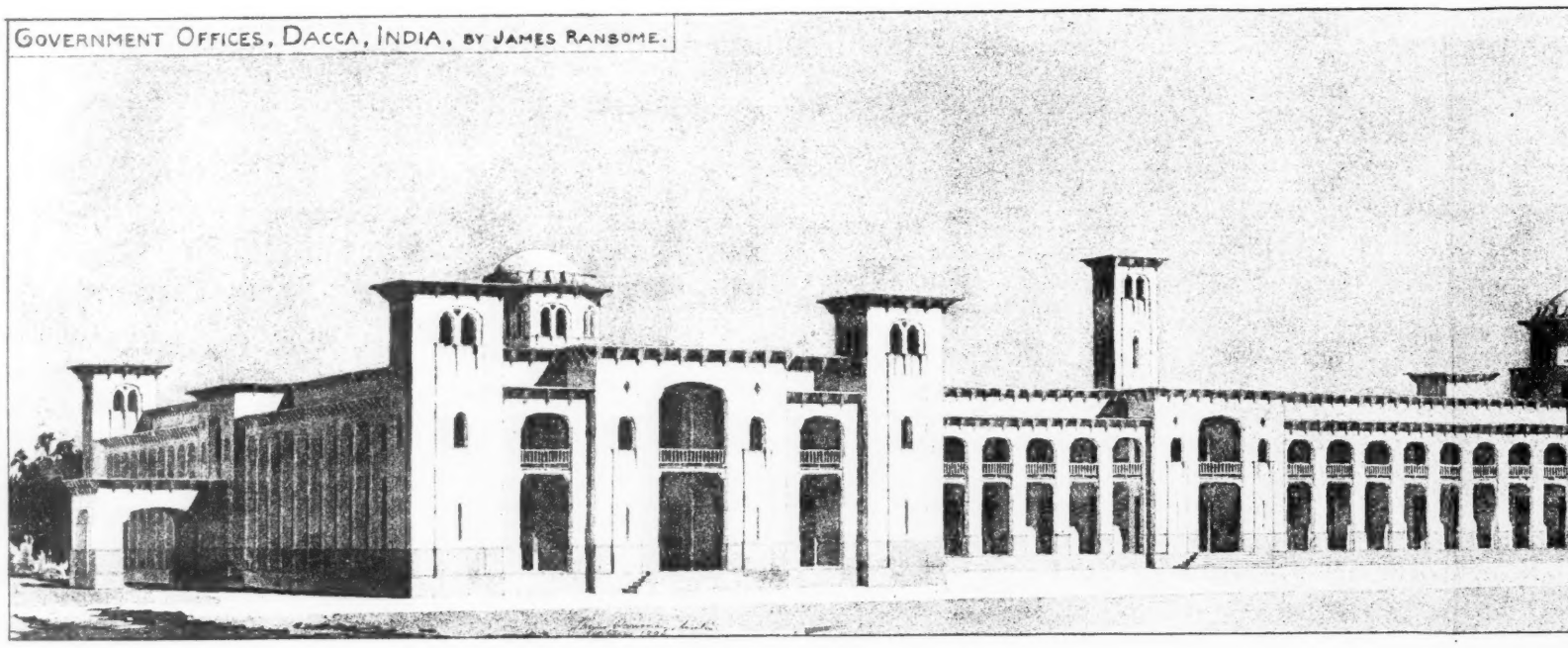
SATURDAY, January 16, was the occasion of the first Spring Visit of the session, the venue being the Selfridge building, near the Marble Arch. The architect, Mr. R. Frank Atkinson, was unfortunately prevented from being present, but the thoughtful provision of a diagram plan and sheet of typed particulars of the building for each member rendered possible an easy appreciation of its main features, and proved a great convenience to the large number who attended.

When exhibited in the 1907 Royal Academy, the preliminary designs were ascribed to the joint authorship of Messrs. R. Frank Atkinson, and D. H. Burnham, of Chicago. The building, embodying some

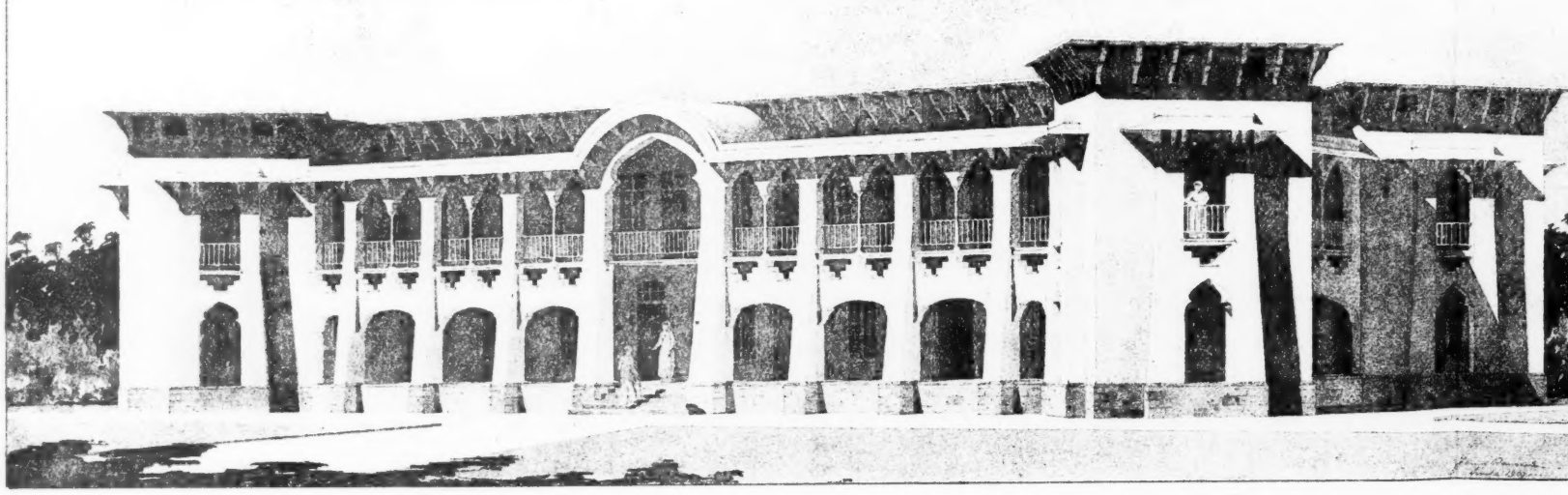


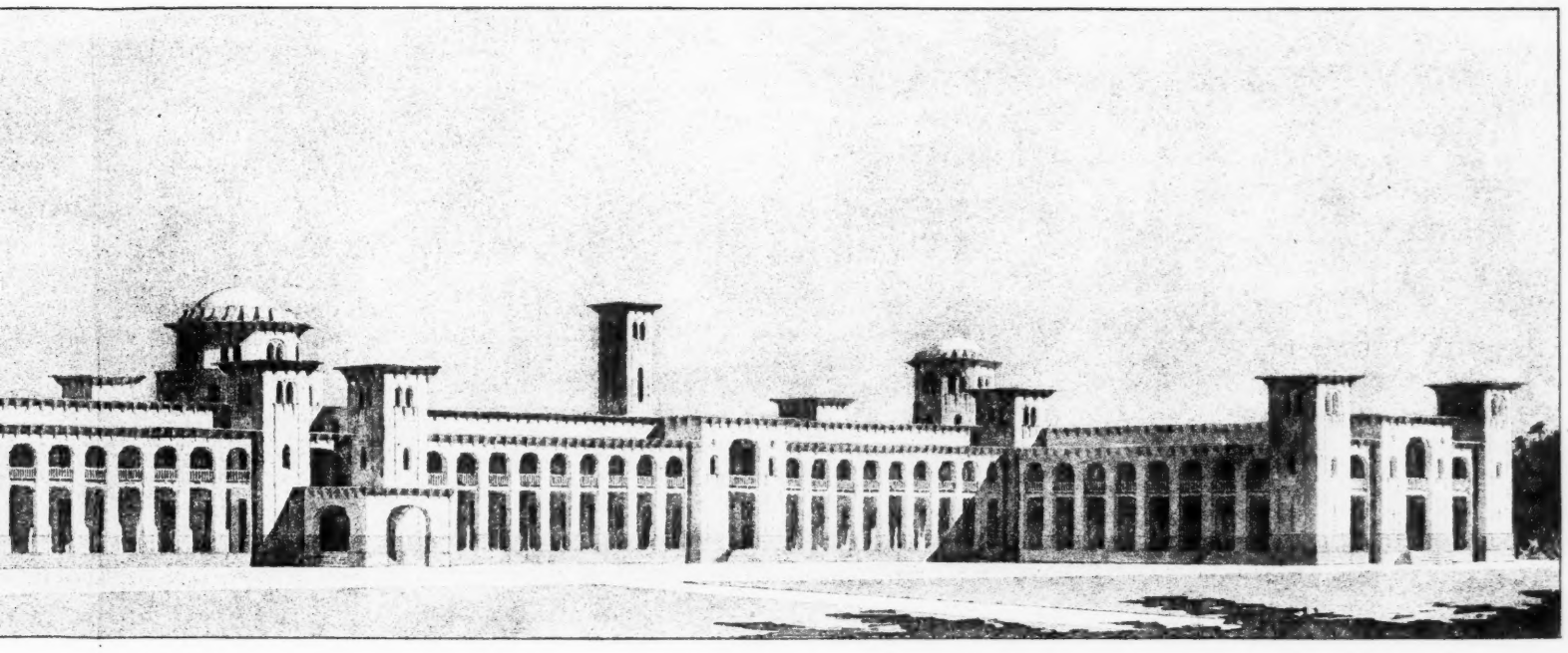
Government Offices, Dacca, India. Plan.

GOVERNMENT OFFICES, DACCA, INDIA, BY JAMES RANSOME.

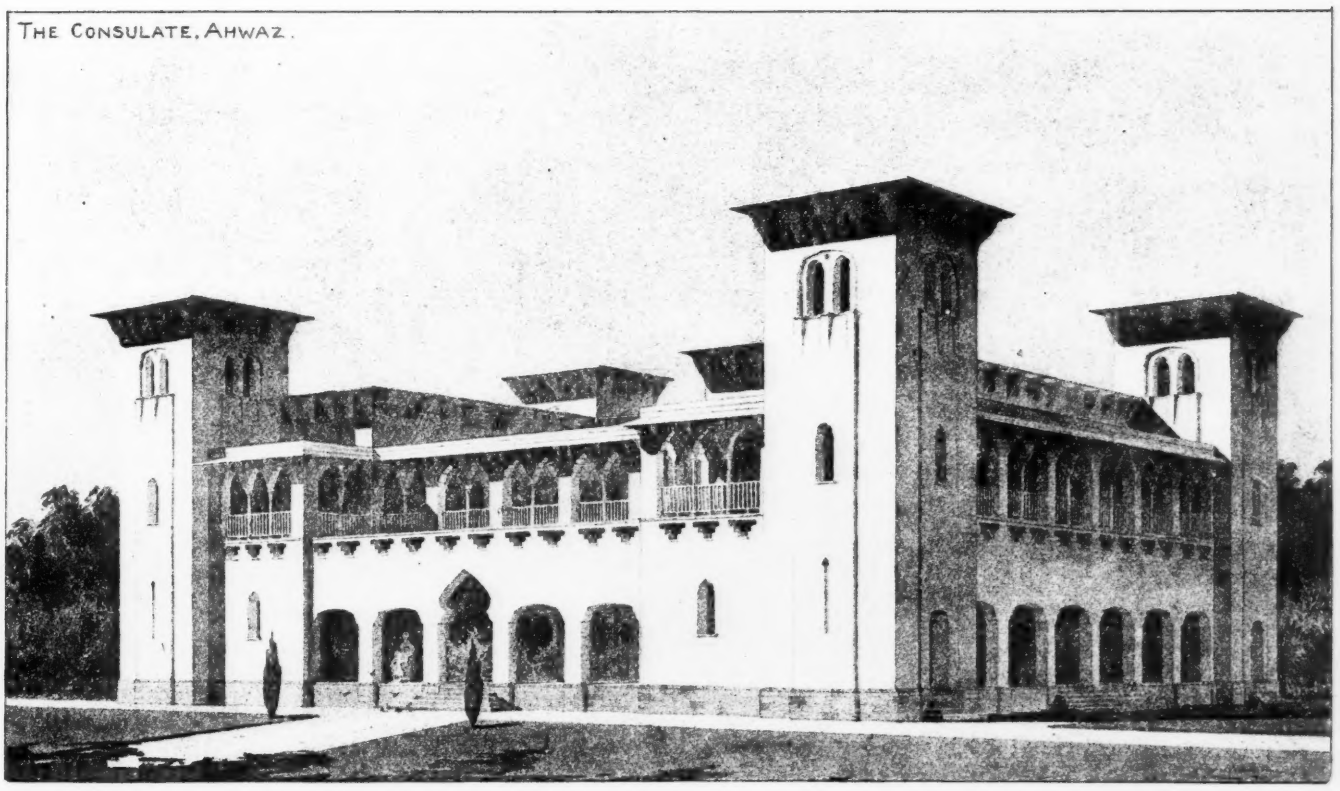


SANATORIUM, PURI.





THE CONSULATE, AHWAZ.



GS IN INDIA.—MR. JAMES RANSOME, F.R.I.B.A., ARCHITECT

The Entrance Pathway

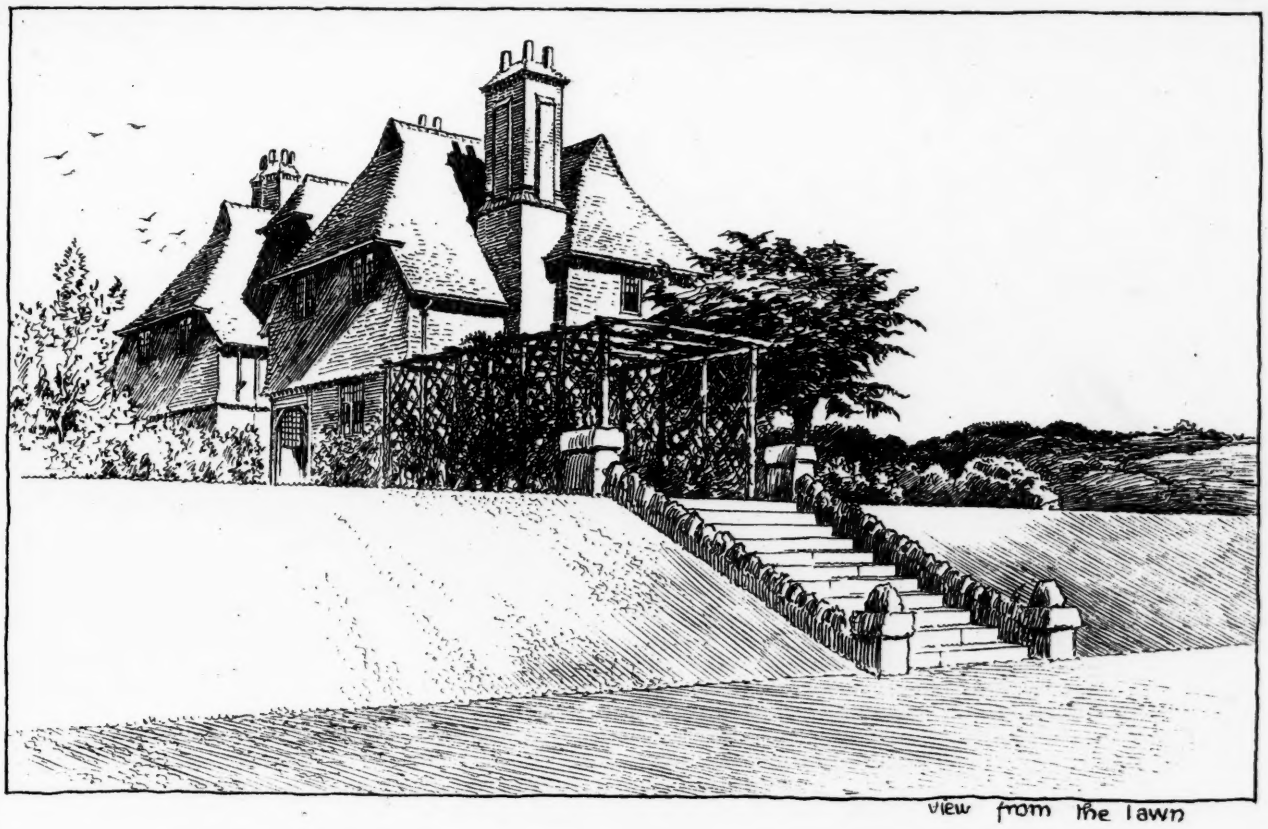
"GILHAM'S BIRC
ROTHERFIEL

Mr E J May F.R.I.B.A.
Architect

View below Terrace

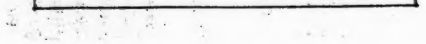
LHAN'S BIRCH"
OTHERFIELD

E J May FRIBA
chitect



View from the lawn

The Entrance Gateway



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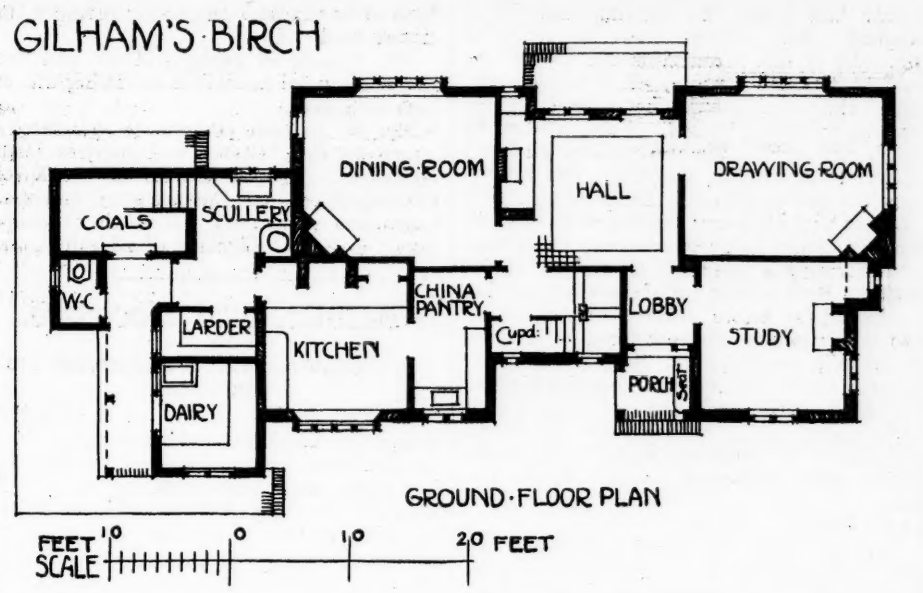


necessary modifications of the original scheme, to accord with the inflexible provisions of the London Building Regulations, has been carried out by Mr. Atkinson. The root idea of the planning is simplicity itself. Adopting a unit of 24 ft. between points of support, the interior of the building is divided into approximate squares of this dimension by lines parallel with two of its boundaries. Steel stancheons are provided at the intersections of the parallels; certain of the square units are left open to serve as lighting wells; and each remaining span is floored with only one intermediate joist, the panels being formed of concrete 6½ in. thick reinforced with indented steel bars. The repetitive work produced by this system is an important factor in obtaining economy in cost.

All weight-carrying not performed by the interior stancheons is done by the outer walls and central party wall only; other internal walls being supported at each floor level by steel beams, although all compulsorily according to Building Act Schedule. By this means a certain freedom for interior rearrangement is obtained.

The frontage to Oxford-street is 214 ft. 6 in., and to Duke-street 176 ft. 8 in. About an acre of ground is covered by the building, which consists of three basements, ground, first, second, third, and fourth floors, all arranged in compliance with the warehouse clauses of the London Building Act. The lowest floor is 50 ft. below the pavement, and is used for heating, artesian well, electric, and other plant. The sprinkler pressure tanks are located in the sub-basement, as are also water storage tanks, the chief part, however, of this floor being used for stockroom purposes. The rear of the basement is devoted to male and female staff locker-rooms and lavatories, also forwarding departments, the front being reserved for sale purposes. The ground, first, second, and third floors will be used generally as sale-rooms, the administrative departments and reception-rooms being on the third floor. Four rooms at the west of the building on this floor will be used as reception-rooms for various nationalities, and decorated accordingly. The fourth floor will be principally a restaurant and tearooms, a feature of which is the roof garden, which is to be treated as an Italian pergola. Lavatory accommodation is provided throughout the building for customers of both sexes, also library and rest-rooms for ladies.

There are five staircases, constructed in reinforced concrete without steel bars or stringers. Nine passenger lifts and two goods lifts are also provided, as well as a gravity package-conveyor on the Somerset-street front.

The question of fire protection has received very careful consideration both in the planning and fitting of the building, and the means adopted are ingenious. Upon the occurrence of fire, imprisoned air in the affected portions of a system of ⅛-in. copper tubes, occurring at minimum intervals of 20 ft. throughout the building, would be sufficiently expanded by the rise in temperature to actuate, by pressure upon a thin sheet of metal, an electrical alarm and indicator, giving warning to the head station of the patentees, and thence to the fire brigade. A further rise in temperature would cause the release of automatic gear at once closing in the parts affected by steel roller shutters which are fitted in pairs to all openings in the internal and party walls (which, by the way, are of maximum size, 12 ft. by 12 ft.). A complete installation of Grinnell automatic hydraulic sprinklers has been installed throughout the building, and these would also be brought into action. All glazing, except to main fronts, is fire-resisting electro-glazing. It appears that the plate-glass windows of main fronts, though obviously inseparable from a drapery business, might prove the weak link in the chain, as they could permit fire to obtain access externally from one floor to another. The steel roller shutters may be actuated independently of the automatic gear when required.

The applied architectural details of the interior construction are mainly carried out in plaster, and are well designed and in good scale for the lofty ground floor, though their subsequent repetition throughout the upper stories produces some unpleasant examples of proportion as the heights diminish.

Externally the bold scale of the Oxford-street and Duke-street fronts compels attention. It is interesting to learn that the main columns are solid, and carry their due portion of the weight of the building. They are of Portland stone 42 ft. high and 4 ft. 9 in. diameter at base, the Ionic caps being about 7 ft. across the volutes. The main cornice has a projection of 3 ft. 6 in. over the public way, for which an application to the London County Council was, of course, necessary. If a giant order is permissible in modern design, the treatment here adopted appears to be the most logical that could be devised. The columns are no mere strips attached to a wall which is the real thing—they are the structure; the filling between a mere screen of cast-iron and glass. The problem of the shop-front is faced—the sheets of glass are the largest that can be made. Owing to the heroic scale of the building, however, they appear not unduly expansive. The shop-blinds to Oxford-street and Duke-street are each in one continuous length, worked internally from the first floor.

It appeared to be the general opinion of members that a considerable measure of success had been achieved in the combination of commercial and æsthetic considerations.

THE INSTITUTION OF MUNICIPAL ENGINEERS.

THE first general meeting of the Institution of Municipal Engineers was held at the Caxton Hall, Westminster, last week, Mr. Pegge, of Durham, President, occupied the chair.

President's Address.

The President, in his inaugural address, said he felt deeply the great honour of being the first President. Many surveyors would probably ask the reason for another municipal institution, but if they would examine the published records he thought they would see that wherever a profession was stable and active there would always be several societies, or offshoots, in pretty much the same branches, all doing excellent work and stimulating the other in their efforts to improve the status and knowledge of the members of that profession.

A municipal engineering society was not necessarily a combination of clever men. Its units must comprise every class, every degree, if its aims were to be realised, and its chief aims should be unity, good-fellowship, and mutual improvement. The profession had never yet received proper and full recognition, and it was the duty of the society to set about obtaining this. Every engineer must put his shoulder to the wheel, and there must be no narrow distinctions or petty prejudices, no invidious exclusions. Too often the council of an institution was run upon entirely the wrong lines. Its first question on receiving an application for membership was "How can we keep this man out?" This was a spirit which could not be too deeply deplored. It was fatal to progress, and was due mainly to the jealousy of those who, having been elected themselves, desired to consort only with the very highest in the profession.

During the last twenty-five years the advent of mechanical high-speed travelling both for passengers and goods meant that the dust nuisance must be grappled with, and the remedy was only to be found in a hard dustless surface that could resist the grinding action of motor-driving wheels. The new road surface must be hand-paved with the hardest possible stone, in a waterproof cementitious mass, something like the face of the old Roman road, or they must try the natural asphalt. But now came the trouble. If they could make a good country road all complete from local material at 2s. to 3s. a yard, they certainly could not possibly pay 10s. He thought the material of the future was to be found in the natural bitumen lakes in Trinidad and local stone and lime ground together, superheated, mixed, and laid on the spot by up-to-date motor-driven tar-macadam machines.

The municipal surveyor found his roads being broken up by post-office telephones and telegraphs, water, gas, and electric companies, and in the larger towns by hydraulic and pneumatic mains, until his streets were like Joseph's coat, if not in colour, certainly in contour. Of what profit was it to the surveyor if his efforts in getting perfect gradients and true lines in his roadways, kerbs, and paths were to be counteracted by the constant breaking-up of streets with little regard to the public convenience, and still less to the value of surface material? Government, companies, or councils in the future who run these concerns (wherever two or three gathered together) should be compelled to build underground ferro-concrete subways to put an end to the annoyance and discomfort; and it would in the long run be an enormous saving to them in maintenance.

Probably the greatest of all questions before the public was the collection and disposal of sewage and storm-water, because it was only remunerative in proportion as the health of the community was improved. It represented probably one-fourth of the local indebtedness of the country, and yet the subject had become the football of the

consulting engineer. There was no unanimity of practice as existing in gas, water, and electricity schemes, and although Government inquiries had been held, all, after all was said and done, were flagrant failures; there seemed no likelihood of arriving at a principle of general application, how best to collect, treat, and dispose of the waste products of commercial life and prevent large volumes of flood-water washing out flourishing valleys from time to time. Watershed impounding areas would probably present a simple remedy for the inundation danger; but for the sewage question, when would they have one system applicable all round, even if differing in detail or ways and means suitable to each district?

Another modern marvel was ferro-concrete. Thanks to the famous Belgian Hennebique and others this was now taking the place of natural stone, and in many cases of iron. It possessed enormous advantages over any other artificial material ever given to an engineer to use. With local stone or gravel at hand they could almost be independent of brickyards, stone quarries, girder works, and many other materials hitherto deemed indispensable in engineering.

He thought they ought to give the surveyor a fair wages clause, and limit the work as well as the hours of labour.

Road Management.

Mr. J. H. Evans, District Main Road Surveyor, Hertfordshire, presented a paper on "Road Management and Repair":—

"The question of highway administration is one of the most important subjects the municipal engineer has to face at the present time, and its serious nature cannot be too highly regarded. Everywhere throughout the length and breadth of the country the cost of the upkeep of our highways, in order to meet the requirements of modern traffic, is increasing to an alarming degree, and a surveyor's position when annual estimates are considered is far from being an enviable one.

Nowadays it does not suffice to apply macadam to a road surface regardless of how that material will wear. It should be applied and consolidated in such a manner as to obtain the maximum wear and best results in every way, and I am strongly of the opinion that in future the different classes of traffic which pass over our roads will have to be considered more closely. It stands to reason that a length of road which carries heavy vehicles near a town should not be compared with another length of road maintained with the same material carrying less traffic, neither would it be reasonable to condemn a perhaps cheaper stone because it has not seemingly worn so well as that on another length having less traffic.

First, let me startle you by announcing that in my district, and I believe throughout the whole of the county of Hertfordshire, a scarifier is unknown. I contend, and perhaps I may be allowed to mention that I speak with an experience of many years in several counties, that a scarifier is a tool not required upon the roads nowadays, certainly not in rural districts, and certainly again not upon 80 per cent. of the roads within a town area. I am firmly of opinion that much more harm than good is done by its use, and the sooner it is discarded the better will it be for the roads, the ratepayer, and the reputation of the engineer. Within my district, at Watford, a scarifier has not been used since I have been in charge, and I look upon the roadways here with a certain amount of pride, and put them forward as the strongest evidence I can offer in support of my contention.

Before spreading new material I consider the best course to adopt is to fill up all hollows or uneven parts and render the old surface as even as possible by rolling. The new material is then applied in the ordinary way, care being taken to see that every shovelful is well and evenly spread, and thoroughly dry-rolled until every stone is dovetailed and firmly laid before the binding material is applied. Only enough (and as little as possible) of this material should be used to cement the new surface, after which clean $\frac{5}{8}$-in. chippings should be spread lightly and swept about, the roller being allowed to finish the work. We use various kinds of material for binding purposes, but always exercise due care to see that it is clean. I make it a rule to carry out this work in short lengths, doing half the roadway at a time and leaving the other half for the use of the traffic. By reserving half the roadway in this manner a far better surface is obtained, as the new work is not interfered with until it is well consolidated. Special attention is given to the dry-rolling before the binding is applied. This is very important, and very little water is used at any time. I always endeavour to repair the main trunk roads which have the heaviest traffic during the summer months, so that every chance is given to them to dry quickly.

We must all be interested in the cure and prevention of dust upon our highways, and I am far from believing that tar, or, in fact, any material in which tar forms the chief ingredient, is the last word with regard to this problem. Dust upon our highways can never be absolutely abolished; but we can, and must, find the means to reduce it to a minimum. Tar has not as yet had a fair chance of showing its benefits in this direction. In almost every county in England and Wales it has been tried during the past two years, but I venture to think with but indifferent success. When tarring is carried out I suggest it is a mistake immediately to cover it with sand or hoggin. These materials are too fine and too absorbent to answer satisfactorily. Nothing but small, clean, dry chippings should be used if one's efforts are to be attended by success. Not until tar is standardised, as suggested by Mr. Brown, of Nottingham, can it be relied upon for work, differing so greatly as it does in every district."

The President remarked that not only surveyors, but the owners of steam rollers, would be glad they were not using scarifiers. As to the dry method of making roads, he could not see how under motor-car traffic they could be successful.

Mr. C. H. A. Eyles (London) contended that with the increased traffic on the roads it was necessary to have improved methods of construction. He believed they would always have dust. He supposed they had in tar-macadam the best road for ordinary purposes, though it was slippery and therefore not suitable for steep gradients.

Mr. Weaver (Gloucester) remarked that traction engines were a cause of great damage, and some tax might be levied on such traction.

Mr. H. Boot (Tunbridge Wells) criticised the practice of making up roads one-half at a time. The join in the middle of the road did not keep the line which the surveyor expected it to keep. Of course, in main roads the practice was absolutely essential. He hoped surveyors would not do anything to hinder the development of the motor-car industry. The Government did everything they could to hinder the development of British industry, and he asked surveyors not to add to that disgraceful business.

Mr. A. L. Bolwell (Bath) was surprised to find the suggestion that it was wise to coat a road in two sections. His experience was that the old system of coating the whole road was the safer. It was almost impossible to avoid a join down the centre of the road if it was done in two sections. He had never used a scarifier, and was pleased to hear Mr. Evans's objection to it.

Mr. L. A. Cozens (Havant) said they did main roads in half sections with success. The road was spread one-half of its width and rolled within 2 ft. of the centre. The other half was then laid in a similar way, and then the centre was rolled. He believed that to be the best way to lay a heavy trafficked road.

Mr. Evans, in reply, said he had been taught by experience that scarifying was the ruin of a road.

Mr. F. Latham (Penzance) presented a paper on the "Status and Subject Detail Appertaining to the Duties of the XXth-Century Municipal Engineers"; and there were also papers on "Scottish Municipal Law" and the "Lighting of a Small Town."

Architectural Societies.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.

At the monthly meeting of the Sheffield Society of Architects and Surveyors, held at the University on the 14th inst., an interesting paper was contributed by Mr. J. R. Wigfull describing a visit paid to Rouen, Caudibec, and St. Wandrille. The President of the Society, Councillor W. C. Fenton, presided. Mr. Wigfull gave a description of the cathedral at Rouen, and also had a few words to say about the various parish churches of the city, including those of St. Ouen and St. Maclou. Afterwards he took his audience to the picturesque little town of Caudibec, where there is a fine church of the XVth century, containing a tablet to the master mason, who, for thirty years, directed the work. The church and the quaint streets of the town were spoken of, and, in conclusion, Mr. Wigfull dealt with the Abbey of St. Wandrille, mentioning its connexion in early times with the churches of Sheffield and Ecclesfield. The great tithes of Sheffield went to the monks of St. Wandrille, and Ecclesfield was a priory of the Abbey until the time of Richard II., when the alien priories were confiscated. The lecture was illustrated by slides made from photographs taken by Mr. Wigfull. At the close there was a discussion in which the President, Mr. Gibbs, Mr. Hall, and Mr. Mitchell-Withers took part.

NORTHERN ARCHITECTURAL ASSOCIATION.

A meeting of the Northern Architectural Association was held at 6, Higham-place, Newcastle, recently, the President, Mr. George T. Brown, F.R.I.B.A., presiding. Mr. W. H. Knowles, F.S.A., F.R.I.B.A., delivered a lecture upon "The Romano-British City of Corstopitum, Corbridge." Mr. Knowles has been actively engaged for some time at Corstopitum in making excavations and carrying out antiquarian research. After describing the situation of Corstopitum, he threw upon the screen slides illustrating the plan followed in its laying out, views of the buildings, sculptured fragments, some pottery, articles of bronze and iron, and of the gold coins found in the excavations, which he described as being almost as fresh in appearance as a gold coin of last year's mintage. In the course of a discussion, following the lecture, a suggestion was made that the Association should visit Corstopitum in the course of the autumn, and Mr. Knowles said that if the members of the Association should decide upon a visit, he would gladly give his services in conducting them over the ruins.

EDINBURGH ARCHITECTURAL ASSOCIATION.

A meeting of the Edinburgh Architectural Association was held on the 13th inst. in the Association rooms, 117, George-street, Edinburgh, Mr. John Watson, the President, in the chair. Mr. Paul Waterhouse, London, read a paper under the title of "A Goodly Heritage." The heritage he spoke of was, he said, the tradition handed down among architects from generation to generation, and in particular the tradition of that set of columnar designs which were known as the Orders. Wishing, as he explained, to be able to say rather more than he had to say on this subject, he had put his paper into the form of a dialogue, in which an imaginary character, a man of fancy and enthusiasm,

claims for the Orders an almost superhuman power over mankind. His friends contest this position in amicable controversy, but the idealist gets his way in argument, and more or less convinces his opponents. He brings home to them the great and ancient dignity of the craft to which they are bound, the mastery which lies in obedience, the fellowship which that obedience brings—a fellowship not only between man and man, but between the living and the dead—and points out that the custody of the Orders is a stewardship for which architects are responsible, and of which an account has to be given.

NOTTINGHAM ARCHITECTURAL SOCIETY.

The second sessional meeting of the Designing and Discussion Club was held at the Society's Room on the 19th inst. The subject set by the Visitor, Mr. W. R. Gleave, A.R.I.B.A., was a design for "District Council Offices." After the criticism there was a discussion in which the junior members took part.

Legal Column.

NEW BUILDINGS AND BY-LAWS.

Sect. 157 of the Public Health Act, 1875, provides that every urban authority may make by-laws with respect to the structure of walls, foundations, roofs, and chimneys of new buildings, for securing stability and prevention of fires, and for purposes of health, and they may further provide for the observance of such by-laws by enacting therein such provisions as they may think necessary as to the power of such authority to remove, alter, or pull down any work begun or done in contravention of such by-laws. By sect. 159 the conversion into a dwelling-house of any building not originally constructed for human habitation shall be considered the erection of a new building.

In the case of Hanrahan *v.* Leigh-on-Sea Urban District Council, an appeal from a County Court, a man (the appellant) had purchased a plot of land which had standing upon it a third-class railway carriage which had been the property of the vendor. The appellant had converted this railway carriage into a dwelling-house, and the defendant Council, having under their by-laws given him notice that this building contravened the by-laws, and having ordered him to pull it down, as he made default, had entered upon his land, pulled down the erection, and removed the materials to their own yard. The appellant had brought an action for trespass and for conversion of the materials. He contended that the defendants were not justified in pulling down the whole structure, but that their powers were limited to removing the alterations made by him. The Divisional Court, affirming the County Court judge, held that the railway carriage, by its conversion into a dwelling-house, became a new building within the meaning of the by-laws made under the above sections of the Public Health Act, and that the defendants were justified in pulling down the whole building.

One word may be said upon the claim for the conversion of the materials, the defendants having taken them to their yard, as in some of the reports of this case the matter has not been specially alluded to. This head of claim had been left by the County Court judge to the jury, who had awarded the plaintiff 5*l.* damages, but as the defendants had paid into court more than that sum judgment was entered in their favour, and there was no appeal on this head. The Urban Council would have no right to take the materials, but sect. 158 gives them the right to recover, in a summary manner, expenses incurred in removing the unauthorised erection, either from the person executing the unauthorised work or from the person causing the works to be executed.

WORKMEN'S COMPENSATION.

The decision of the Criminal Court of Appeal in the case of Rex *v.* Crossley, that proceedings for perjury can be taken against a person who swears falsely in an arbitration before a County Court judge, under the Workmen's Compensation Act, is one of importance, seeing the temptation of giving inaccurate evidence in order to obtain compensation. The decision, however, leaves one or two points in uncertainty. The difficulty has arisen because the Workmen's Compensation Act provides that the Arbitration Act, 1889, shall not apply to arbitrations under the Act, and sect. 22 of the Arbitration Act is that which renders a person committing perjury in an ordinary arbitration liable to be prosecuted. The present decision covers the case where the County Court judge is acting as arbitrator, but the Workmen's Compensation Act provides for other persons acting as arbitrators, and the decision does not cover evidence given before these other tribunals. For instance, where a representative committee of employers and workmen exists, a very common occurrence nowadays, unless either party objects, that is the tribunal which has to decide the dispute; then there is the possibility of an agreed arbitrator being appointed by the parties; and, lastly, the case may be decided by an arbitrator appointed by the County Court judge, with the concurrence of the Lord Chancellor.

The reasons given for the decision of the Court of Criminal Appeal would appear to apply equally to proceedings before an arbitrator appointed by the judge, as he has all the powers of a judge, and the parties have no voice in his election, and, therefore, evidence falsely given before him would render the deponent liable to be prosecuted for perjury; but as regards the other two tribunals the reasoning is all the other way, and it would seem that in the case of committees, unless an order has been made by the Secretary of State, under Sched. II., paragraph 16 of the Act, conferring upon them the powers of County Court judges, proceedings for perjury arising out of evidence given before them could not be taken, nor in any event in the case of evidence given before an agreed arbitrator. The simplest method of dealing with these questions would be to pass a short Act applying the provisions of sect. 22 of the Arbitration Act to all such proceedings. The necessity of any decision on such a point is but one more example of the ill-thought-out character of this legislation.

REVOCATION OF PATENTS.

A further decision has been given by the Comptroller-General of Patents, under sect. 27 of the Patents and Designs Act, 1907, which has some bearing upon the point raised by the United States Consul at Glasgow upon which we commented last week.

The application was for the revocation of a patent which related to sewing machines, on the ground that the patented article was manufactured exclusively or mainly outside the United Kingdom. The applicants were, or were about to become, agents for a German company, in which country the article was not patented. The machines were manufactured in the United States, but before they were sold here a few parts manufactured in this country were substituted, and certain accessories often sold with the machines were also manufactured here. It was alleged that it would be impossible to manufacture the machines entirely in the United Kingdom, because neither the necessary tools nor the requisite highly-skilled labour to make some ten out of the seventy-five patented parts could be procured here. The Comptroller left out of consideration altogether the accessories, as they formed no part of the patented machine, and he held that the manufacture here of the substituted parts, which were merely modifications made to suit the taste and convenience of certain purchasers, did not meet the demand in this country for the patented article. He also did not accept the contention that it was impossible to carry on the manufacture in this country.

The patentees contended that it would be five or ten years before they could completely manufacture the machines here, whilst the applicants stated that the German firms were able to complete a machine in six months. The patent had only a little less than two years to run, and therefore the Comptroller said there could be no object in deferring the order, and he ordered the patent to be revoked. The power to defer revocation, he explained, was conferred by the Act for the protection of patentees who had of their own initiative taken steps to comply with the statute, and who required time to complete their arrangements.

The two important points to be noted in this decision are—(1) That the manufacture here of unimportant accessories was held not sufficient to comply with the statute, and to constitute the article manufactured now to "an adequate extent," and therefore, *a fortiori*, it may be assumed that a mere "assembling" of manufactured parts would still less suffice. (2) That so far as relates to the manufacture "to an adequate extent," according to the report in the *Times*, the Comptroller appears to have based his finding not on the extent of the operations, but on the public demand for the article here. The decision of a superior court on this part of the section will be awaited with considerable interest.

The effect of the decision is the same as that in the previous cases. The consumer here will get a choice of markets, as the German manufacturer will compete with the American manufacturer, but it will be open to an English firm to step in and cut out both if it can.

WATER RIGHTS.

The rights of riparian proprietors involve complicated considerations and give rise to much litigation. In the recent case, Whitmores (Edenbridge), Ltd., *v.* Stanford, the plaintiffs were owners of an ancient tannery, and through their premises ran a mill-stream in an artificial cut, which had been constructed several centuries ago. The defendants were the owners of an ancient corn-mill lower down the cut, but they also owned a weir and sluice-gates across a river where the water entered the cut. Between this point and the plaintiffs' property other properties intervened. In 1907 the defendants cut off the water and interfered with certain pipes in the bed of the cut by means of which the plaintiffs obtained water. The plaintiffs brought the action for an injunction restraining the defendants from interfering with their right to extract water, and for trespass in respect of which they claimed 25*l.* 5s. 9d. special damage. As regards the claim for trespass the court held that there was evidence to show that the bed of the cut was vested in the plaintiffs, and as regards the right of the plaintiffs to abstract water, as there had been open and notorious user of the water for 250 years, the court held the plaintiffs entitled to its reasonable use, and gave judgment for them under both heads of the claim. In the case of artificial and permanent watercourses the exact origin of which is unknown, the presumption of ownership of the bed and of the right to use of the water seems to be the same as in the case of natural streams. The owner of land on the banks is presumed to be the owner of the bed *ad medium filum*, and each owner has the right to the ordinary flow of water, but such presumption may be negatived, of course, by positive evidence. The law on this subject was considered by the Court of Appeal in Bailey & Co. *v.* Clark, Son, and Morland (1902). In that case a previous decision of a judge of the Chancery Division, Burrows *v.* Lang (1901), appears not to have been referred to, although the judgment in this latter case draws some

distinction between natural and artificial watercourses, but there the watercourse was constructed wholly on the defendant's land, and was a source of expense to him, and was made solely for the purposes of the mill of which he was owner, although the plaintiff had access to a pond, and it was held that the plaintiff had no right to the use of the water. In such circumstances the presumption that the watercourse was constructed on the terms that each riparian owner should have equal rights did not arise.

BOOKS RECEIVED.

PHOTOGRAPHIC OPTICS AND COLOUR PHOTOGRAPHY. By G. Lindsay Johnson, F.R.C.S. (Ward & Co.)

BOSTON AND ITS SURROUNDINGS. By Walter Moore. (The Homeland Association. 6d.)

Competition News.

CARNEGIE LIBRARY, NEW MILLS.

In connexion with the proposed free library, for the building of which Mr. Andrew Carnegie has made a grant of 2,000*l.*, the New Mills District Council and the Free Library Committee recently invited designs, offering premiums of 15*l.*, 10*l.*, and 5*l.* respectively for the first three. The designs having been fully considered, the awards have now been announced as follows:—(1) Mr. R. B. Preston (Disley and Manchester); (2) Messrs. Butterworth & Duncan (Rochdale); (3) Messrs. Potts, Sons, & Hennings (Manchester). The designs of Mr. Preston have been adopted.

TYNEMOUTH PALACE COMPETITION.

The Tynemouth Aquarium and Winter Gardens, erected some years ago at a cost of 80,000*l.*, has again changed hands, and the new owners recently invited plans for the improvement of the building. The result has just been made known. The successful competitors are Messrs. Marshall & Tweedy (Newcastle and North Shields). Their scheme includes the erection of a large theatre and concert-hall for 3,000 persons, and a skating-rink 70 yds. long.

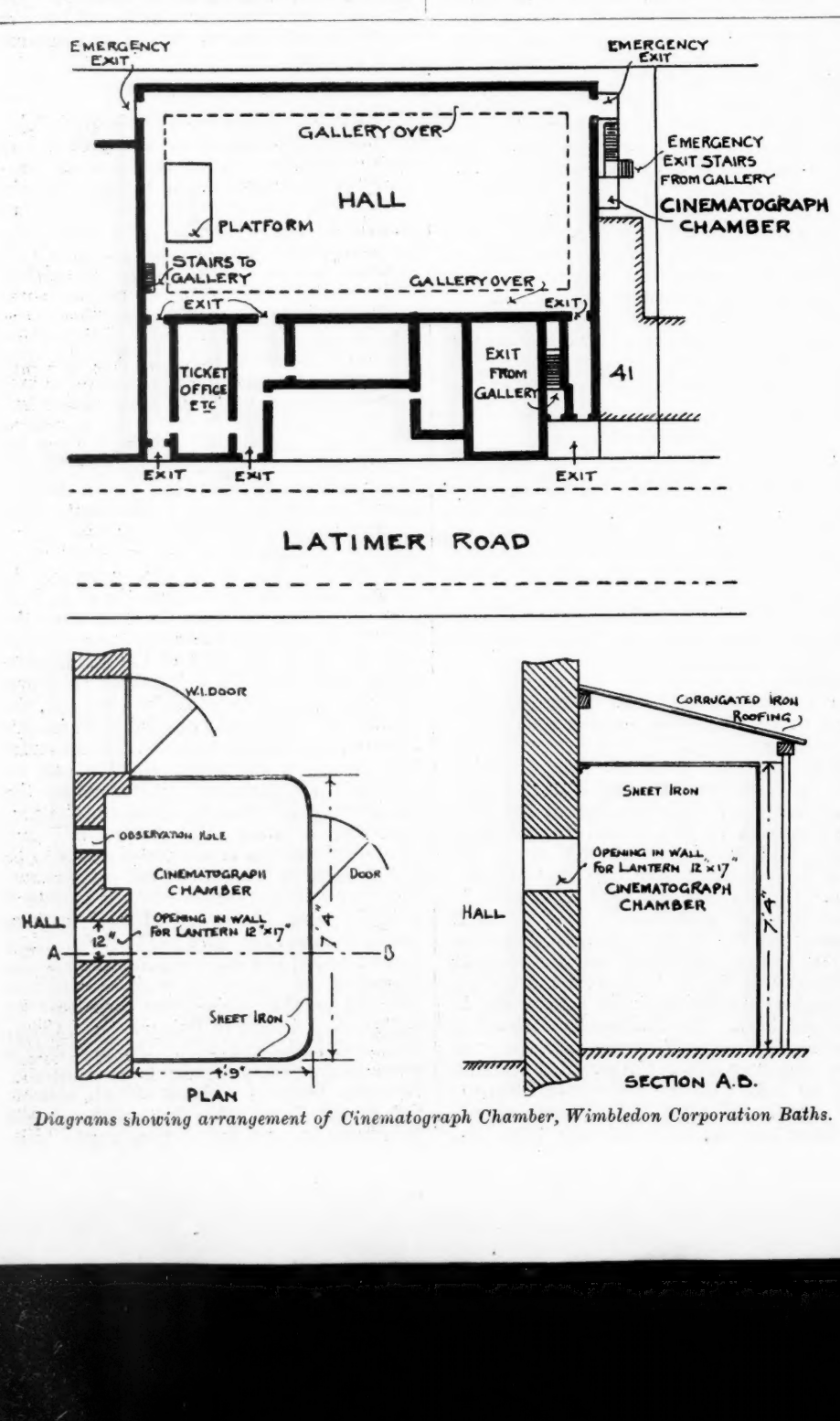
Correspondence.

ACCIDENTS FROM CINEMATOGRAPHS.

SIR,—The accident that happened on Boxing Night at Stratford, through the ignition of a cinematograph film is only one of many similar accidents caused through the ignition of these films. The accident illustrates the inefficiency of the latest law to cope with this danger, a danger which must exist so long as the lantern containing the explosive film is housed in the same hall as that which contains the audience. The fact that the lantern may be contained in a chamber partly constructed of metal has little effect in avoiding panic and a spread of fire, inasmuch as there must be certain openings in the walls of such chamber: (1) to allow of the pictures reaching the screen; (2) to allow the operator access to the lantern. When a film is fired it is not to be supposed that the operator will remain within the chamber to perish as a martyr, but will open the door and escape, thereby allowing the fire free vent into the hall containing the audience.

I enclose a sketch showing the arrangement adopted at the baths belonging to the Wimbledon Corporation in Latimer-road, Wimbledon, where I have had a cinematograph chamber, which contains the lantern, placed in the open outside the hall. The arrangement has been found to work well; in fact, several operators have expressed their high appreciation of it. It offers security to the audience against fire, and a still further advantage of a cool chamber for the operator, who can, at any time the chamber gets at all heated, open the external door.

C. H. COOPER,
Borough Engineer and Surveyor,
Wimbledon.



Diagrams showing arrangement of Cinematograph Chamber, Wimbledon Corporation Baths.

THE ROYAL SANITARY INSTITUTE.

A SESSIONAL meeting of the Royal Sanitary Institute was held on the 13th inst., at 74, Margaret-street, W., when a discussion took place on "The Purification of Water by Ozone and other Chemical Substances." The discussion was opened by Dr. S. Rideal, D.Sc., F.I.C., who said that ozone was the ideal agent for purifying, since it left behind it only ordinary oxygen and nothing foreign in the water. In October, 1908, he examined the working of De Frise's installation for the sterilisation of water by ozone at the St. Maur Municipal Waterworks of the City of Paris. The works furnish a large portion of the water supply of Paris, drawn from the River Marne, a stream which receives a considerable amount of sewage pollution above the intake. At the works, for the ordinary supply, the water was pumped into sedimentation reservoirs, then drawn off and filtered through gravel and sand. He found that this filtrate had no odour, was clear, and in small quantities was practically colourless; in bulk it had a varying tint of greenish-brown. On the surface of the water in the reservoirs, and in the channels, gelatinous green masses containing water algæ were frequent. The straining-beds of gravel and sand did not completely remove these organisms, and the water which passed through them, although generally clear, was by no means pure or safe, as he had shown by his bacterial and chemical investigation. It was obvious that further precaution was imperative, that the present reliance on filtration alone carried constant danger from pathogenic bacteria, and that sterilisation, as far as it could be practically effected, was an urgent need. For this purpose ozone had always seemed a most suitable and natural agent for two chief reasons:—(1) It was only a more active form of ordinary oxygen, already existing normally in small quantities in the atmosphere, and continually assisting in natural oxidations; (2) it added no residue of any chemical to the water, and in doing its work of purification it was simply resolved into ordinary oxygen, which dissolved in the water and added slightly to its aeration. Experience and researches had proved that it was more economical and practical to supply the ozone in a state of large dilution with air, avoiding contamination with nitrous compounds or other impurities, and in a series of careful tests he observed that the Siemens-De Frise ozonisers now in use at these works yielded the gaseous mixture in a very pure state. The results of the bacteriological examination proved, as a general conclusion, that the ozone treatment destroyed all but the more resistant spore forms of bacteria present in the filtered water, coli and allied intestinal organisms were entirely eliminated, and subsequent contamination being excluded, there was no recrudescence of this class of organism. The ozonised water during the period of the tests showed a uniformly constant degree of sterility as against a very variable bacterial content of the unozonised filtered water. The water as leaving the sand filters at the St. Maur works, and augmenting the Paris supply, was decidedly inferior to the London water supply. The results with the ozonised water showed that it was of far greater bacterial purity than that obtained by any adopted method of sand filtration or storage; the ozone treatment produced water which was superior to the high-class London waters obtained from the Kent deep wells, and that had been subjected to natural filtration. As to the relative circumstances existing in Paris and in London, both towns derived their drinking supplies partly from rivers and partly from wells, the latter giving water which had hitherto been regarded as of sufficient purity to require no artificial purification, while the river waters had for many years past been subjected to sand filtration. The amount of purification which a sand filter was capable of ensuring depended upon the original purity of the river water to be treated; and as in both cases the rivers had been getting more and more contaminated with the growth of the upper riparian populations, it had been found that this purification did not now result in a water which was equal to the standard of deep-well supplies, and consequently there was no method of ensuring a given purity without largely augmenting the number of existing filter-beds, and at the same time maintaining a very efficient bacterial control. Thus in

London at the present time the Water Board had 160 filter-beds, the greater number of which were in constant operation, and despite the very great number of samples examined day by day at the laboratories, water was constantly passing into public supply the quality of which had not been bacterially determined. In Paris it had been proposed to safeguard the purity of the water by an ozone treatment after the existing sand filtration, whilst in London during the last few years the Water Board had proposed to adopt storage of the crude river water for a length of time sufficient to ensure the destruction of all or nearly all the typhoid bacilli, and so to prepare a water by this "safety change" that the existing filter-beds would continue to do satisfactory work. So much was this the case that the advisers of the Water Board of London were of the opinion that a well-stored rapidly-filtered water was likely to be safer than an unstored slowly-filtered water. From the work already done in this direction, it would appear that in London the average impurity of the present raw river waters was of such a character that no less than two months of storage would be necessary in order to ensure the death of all typhoid bacilli, and, as a compromise, it was suggested that provision should be made in London for a four weeks' storage before filtration. It was obvious that the length of time to improve the quality of the water up to this safety standard was greater than the number of days which were necessary to ensure a sufficiency of quantity, and Dr. Houston, in his report, specially pointed out that after having provided a storage capacity of four weeks a slow rate of filtration should still be maintained at the existing filter works, so that no economy in the cost of filtration as ordinarily practised was to be expected, at any rate until after the new *régime* had had sufficient trials. But stored water might behave very differently to the unstored waters hitherto treated. It would seem, if the conclusions of Dr. Houston were correct, that the proposal to increase the storage of the river water to four weeks must be accompanied by an increase of the number and area of the filter-beds, if the rate of filtration was still to be maintained as at present. In order to ensure the storage of all the water supplied to London it was necessary to recollect that this amount could only be taken from the rivers Thames and Lea in the absence of both high flood and of drought, and consequently the existing storage reservoirs, at present holding nearly forty times the daily average supply, would not only require rearrangement, but also suitable additional works before they could fulfil the conditions laid down. Hence the subject resolved itself into an engineering problem, and an inquiry whether the outlay on these additional works would secure the same quality as an ozone treatment of the existing water as it left the filters. He understood the Paris municipality had decided to ozonise the whole of their Marne supply at St. Maur, equal to 90,000 cubic metres per day. The water to be treated would pass through the existing filters at twice the present rate, viz., 16 ft. instead of 8 ft. per twenty-four hours. An ozone installation capable of treating 10,000,000 gallons a day (half the above quantity) would be erected at St. Maur, and no further outlay for storage or filters would be incurred. The whole of the water passing through the filters, whatever its coli content, would be ozonised at an expenditure of 135 B.T.U. per million gallons. Under the ozone treatment an immediate chemical test gave the safety factor which was required for successful working in such a way that no doubt could be raised as to the purity of the water; but on the other hand by the present dependence on storage and filtration, although the safety change might be assumed to take place in the proposed reservoirs, the uncertainty of the quality of the water on leaving the filter-beds still remained. All towns with a river-water supply had at present conditions similar to those of Paris and in London, and the reasons for an ozone treatment seemed therefore applicable. Many other places whose conditions of supply involve drawing on wells which might be subject to occasional or periodic pollution could by this treatment ensure a guaranteed purity. His general conclusions as the result of this investigation were that:—(1) The ozone treatment of a filtered river water as carried out at St. Maur, Paris, works by the De Frise process was a satisfactory method of ensuring a standard of purification for a municipal water supply equal to modern requirements; (2) the De Frise process differed, in his opinion, from all previous attempts at water sterilisation by means of ozone in combining the De Frise steriliser and ozone recuperation system with the Siemens-De Frise ozoniser, which combination avoided the difficulties attending the use of the emulsifiers and sprayers which had been hitherto used for this purpose, and was attended with a low cost for renewals owing to breakages in the dielectric.

An interesting discussion followed, which was taken part in by Professor H. Robinson, Colonel Davies, Mr. A. J Martin, Dr. Nash, Mr. E. Devonshire, Mr. Dibden, Mr. Shenton, and Mr. Bernard (Chairman of the Metropolitan Water Board). Several of the speakers pointed out that, notwithstanding complaints which were sometimes made, the rivers of this country were kept far purer than those on the Continent, and the raw water supplied to London was of a very different character to that which was supplied to Paris.

Mr. Bernard pointed out that, taking the author's own figure of the cost of the ozone treatment, it would mean an additional expenditure of 90,000*l.* a year, so far as London was concerned, and this was exclusive of other items of cost which Dr. Rideal had no information about.

Replying to various questions raised, Dr. Rideal said the larger the amount of organic matter in the water the larger was the amount of ozone required, and consequently in dealing with the London supply the quantity would be less than that required at St. Maur. He considered it possible to replace sand filtration entirely by ozone purification where the organic matter in the raw water was small, and it was also possible to use the apparatus on the occasion of emergencies. The point he had tried to put was not whether ozone treatment would cost 90,000*l.* a year for the London supply, or any sum, but whether the cost would be greater than that at present being incurred in the construction of large storage reservoirs. That was a matter on which no information had been forthcoming during the discussion.

THE BUILDERS' FOREMEN'S ASSOCIATION.

ANNUAL DINNER.

THE fifteenth annual dinner of the Builders' Foremen's Association was held on Saturday last week in the King's Hall, Holborn Restaurant, W.C., Mr. W. Millar Higgs (Messrs. Higgs & Hill) presiding, being supported by Lieut.-Col. G. E. Holman, Messrs. C. Bussell, T. Brown, W. Bloore, J. Cameron, T. Sturge Cotterill, J.P., H. F. Higgs, R. P. Higgs, W. Matthew Hill, C. E. Hodges, H. W. Jenks, C. Ferrier, W. Faldo, S. E. Purdie, F. G. Rice, G. Smith, S. E. Wallis, E. Wimperis, F. Whitehead, A. D. Ford (President of the Association), J. W. Sawyer (Vice-President), Benton Rees, G. Thomson, and others.

The loyal toasts having been proposed by the Chairman and suitably honoured,

The toast of the evening, "The Builders' Foremen's Association," was proposed by the Chairman. He said the Association was composed mostly of builders' foremen, although there were amongst the members men who belonged to the allied trades, and also clerks of works, who were warmly welcomed as members. The builder's foreman was, generally speaking, a good all-round man, but his position was not an easy one; his responsibilities were great, and in these days of competition, when prices were cut to the lowest point, a foreman had all his work cut out to carry on the job in a proper way, and to the satisfaction of all parties concerned. In these days of depression in trade, the life of a man who took on and discharged the workmen was not an enviable one. That Association could not help being of assistance to foremen. Since it was established in 1894, it had steadily increased both in membership and usefulness. Lectures on trade matters were from time to time arranged, and visits to buildings in course of erection frequently took place, when the members had opportunities of exchanging views with one another on matters connected with their daily work. This quickened their interest in what they had to do from day to day. Last year had been a trying one, but the Association had held its own, and he asked any young foreman not a member to join the Association. Unity was strength, and young men would be gladly welcomed, and they would receive much help by joining. The Association had a Contingent Fund for the purpose of assisting to a limited extent members who were in distress, and the Insurance Fund of the Association provided a sum of 10*l.* to the widow of a deceased member. A Pension Fund had lately been started, which came into operation for the first time this year, and he had made a special appeal to those he had business relations with in order to give the fund a good send off. He had much pleasure in being able to hand to the hard-working and energetic Secretary, Mr. Rees, a cheque for 135*l.* The fund provided for a pension of 5s. per week to a member of the Association of fifteen years' standing and of 60 years of age if not in work, and the benefits were extended to widows of deceased members. To put the fund on a firm basis would be the object of every member, and he hoped the time would come when they could pay a grant of 7s. 6d. per week to members of the Association—men who had spent so much of their lives in superintending the erection of the beautiful buildings we had in London. With the toast he coupled the name of the President of the Association, Mr. A. D. Ford.

The President, in reply, said he wanted to say a word in regard to their policy towards the ever-changing state of their great industry. An industry, with such a diversity of activities as the building industry claimed to have laid under contribution to the finest products of its art, must stand among the greatest of the industries of the world. Change must be the essence of its progress, and all who would contribute efficiently must adapt themselves to its demands. Efficiency and progress were the ensign of the Builders' Foremen's Association. They welcomed the specialist in the various departments of their work, knowing, as they did, that it was only by specialisation that improvement could be secured and perfection reached. So they were continually seeking instruction in new ideas, methods, and discoveries, and their requests invariably received cordial response and valuable help. They strove to be competitors and co-operators. They believed in competition, but it was the competition that had for its object the spirit of emulation for individual excellence. The moment competition tended to undermine sound and honest trading, they had suspicion of its value. Then association for mutual benefit could alone stand the test of time, and it was this associated effort they desired to see extended. And they knew that none could organise and co-ordinate the energies engaged in a great concern so well as those who understood it. They also knew something of the great qualities possessed by the leading men in the building industry, and these qualities only needed a closer union to revive trade and improve the material interests of all concerned.

Mr. E. Wimperis, F.R.I.B.A., then proposed the toast of "The Building Trades," and said that the great building trade and the allied trades represented to us in this country something more than an industry; they represented very largely the history of our country. The trade was not a modern growth; it was as old as man himself, and it was not a stationary growth, for, on the other hand, it was as new as the Japanese Empire, and it was a scientific growth. That day he had read that the Japanese had a remedy for earthquakes, and that they were building in ferro-concrete. As to the great depression in the trade, they should do all they could to cure it, and adopt any remedy that gave promise of success.

Mr. F. G. Rice (Messrs. Rice & Son), in response, said they were hoping for better times, and brighter times were promised, and he hoped they would soon come. Some people considered that the new patent laws would result in the erection of more factories, and that that would lead to a change in building. The London County Council were introducing a Bill dealing with structures of the iron skeleton type and ferro-concrete, enabling buildings to be erected with thinner walls; and as reference had been made to specialists, he should like to suggest to builders' foremen to become specialists in that form of construction. In his opinion it would be a type of building largely used in the future, and it behoved every one of them to be acquainted with such materials, so that when employers had works of that kind to do, instead of having recourse to the specialist, they would be able to rely on the foremen whom they knew and in whom they had confidence, and placed reliance. He had been much struck sometimes with the manly manner in which the builders' foremen met the architects. Emerson said:—"Nothing astonishes men so much as common sense and plain dealing," and that was the sort of feeling he would urge every foreman to adopt—to have common sense, and plain dealing with architects when carrying out their buildings. He had just been reading a book giving an account of two stones found in Babylon, giving the code of the civil laws, 4,000 years ago, and he was surprised to find that there was a Building Act then. It contained one sentence, which was most drastic, and it enacted that if a builder was building a house and had not made his work firm and it fell down and killed the owner of the house, that builder should be put to death.

Mr. W. Matthew Hill then proposed the toast of "The Architects and Surveyors." Could they point to any business in which two classes of men were associated in which a better feeling existed than between the architect and the general foreman? One of the chief reasons was that the architect represented theory and the general foreman practice As to the

surveyor, he was the general foreman's guide and comforter, for were not his accurate quantities the best guide a foreman could have, and was he not a true comforter when he came to take up the foreman's list of extra works?

Lieut.-Col. G. E. Holman (Messrs. Holman & Goodrham), in reply to the toast, said that architects owed a great deal to the foremen, and he thought the builders did also—far more than they always knew. As to quantities, he was one of those architects who did not prepare his own quantities, and he thought that the client who paid for the quantities ought to have the benefit of the brains of another man. The architect could not help being somewhat prejudiced, and could not very well hold the scales evenly when judging what was an extra and what was not. Architects generally wanted something done for nothing, and if they added something it cost them 10,000*l.*, and if they left half the job out they only saved 2s. 4½d. They were indebted to the quantity surveyors who settled the accounts, especially when the omissions came to far more than the original contract.

Mr. J. W. Sawyer then proposed the toast of "The Visitors." He said they were grateful to those who supported them on that occasion. Their visitors recognised that as a body of men the Association was deserving of their consideration, and they made their foremen feel that however humble might be the part they took in the building trade, they still were necessary co-operators with them. The architect placed his designs of beauty and utility in their hands, the builder gave to them the control and execution of his contracts for the erection of these designs of beauty and utility, and so in a sense they were all partners and co-operators together in the production of those solid, speaking though silent witnesses of a nation's thought and skill. And there was the pecuniary aspect of the case. What should they do without the financial aid they received from their visitors?

Mr. T. Sturge Cotterill, J.P., replied, and referred to the signs of improving trade. The depression had been very serious in many parts of the country, but he was pleased to say—and he said it with some knowledge of the trade in different parts of the country—that there was a silver lining to the cloud in the north which he believed would extend to the south. At Newport, in South Wales, he heard that there was not an empty house in the town. They would be glad to hear that said of London and elsewhere, so that they mgiht get a share in the prosperity when it came.

Mr. W. Faldo then suitably proposed the toast of "The Chairman," who responded, being received with musical honours.

The proceedings then terminated.

Master Builders' Associations, etc.

NATIONAL FEDERATION (MIDLAND CENTRE).

The annual meeting of the Midland Centre of the National Federation of Building Trades Employers of Great Britain and Ireland was held at the Imperial Hotel, Birmingham, on the 14th inst. The President (Mr. W. Wistance, of Walsall) presided, and among those present, representing Master Builders' Associations in the Midlands and affiliated to the centre, were Col. J. Barnsley, County Councillor J. Dallow (Blackheath), Councillor H. Smith (West Bromwich), Messrs. F. G. Whittall, J. B. Whitehouse, and Albert S. Smith (Birmingham), J. H. Walker (Derby), J. Stokes (Worcester), W. Yates (Leicester), H. Willcock (Wolverhampton), J. Wright (Nottingham), R. P. Gathercole (Leamington), A. Brazier (Bromsgrove), and Fred. W. Amphlet (Secretary). The annual report stated that the building trade was in a more depressed condition during the past twelve months than for many years past. There seemed to be, however, a disposition in some quarters to think that the tide was now slowly turning. There had again been freedom from serious labour troubles during the year. The difficulties which had arisen had mostly been satisfactorily dealt with by the conciliation boards. The associations affiliated to the centre were the same as last year. County Alderman J. Bowen, who had served the centre faithfully since he was appointed first President in 1898, had retired from business, but was retaining his association with the Federation by becoming a private member. Four meetings of the Midland Centre Conciliation Board had been held. At the first meeting, in January, a dispute with the Wolverhampton bricklayers was settled. The second was the annual meeting in May, when the officers were elected. At the third a dispute with the bricklayers, carpenters, and labourers at Leicester was considered, but no definite decision was arrived at, this being the first case which the Board had been unable to settle. It was referred to the National Board, and decided in favour of the operatives. The fourth meeting was held to consider a dispute between a firm of Liverpool contractors, engaged on a job in Birmingham, and the local bricklayers. It dealt with the rate of payment to night gangs, and was decided in favour of the operatives. The collective insurance scheme with the Law, Car, and General Insurance Corporation (for insurance against workmen's compensation risks) had again been well taken up by a number of associations. It was satisfactory to record that not a single complaint had reached the Secretary in regard to the settlement of claims. The accounts showed a balance in hand of 40*l.* 0s. 10d. It was estimated that when the unpaid subscriptions were remitted there would be a credit balance of 62*l.* 12s., in addition to the sum of 55*l.* 13s. contributed to the Midland Centre Reserve Fund. The retiring President was heartily thanked for his faithful services during the past year. A revised set of rules for the centre was approved. It was decided to request the National Federation to take such steps as they deemed desirable to prevent the growth of the practice on the part of architects and others of requiring builders to furnish priced quantities with tenders. The officers for this year were appointed as follows:—President, Councillor H. Smith (West Bromwich); Vice-Presidents, Col. J. Barnsley and Mr. Albert S. Smith; Auditors, Messrs. F. H. Fish (Nottingham) and J. H. Walker (Derby); Treasurer, Mr. H. Willcock (Wolverhampton).

PROJECTED NEW BUILDINGS IN THE PROVINCES.

BIRMINGHAM.—Factory, for Messrs. Mitchell, pen-manufacturers. Mr. F. B. Andrews, architect, 95, Colmore-row, Birmingham.

Bristol.—Extension, All Saints' Church, Fishpond-street. Messrs. E. H. Lingen-Barker & Son, architects, 3, Unity-street, College-green, Bristol.

Carshalton.—Accommodation for vehicles, Children's Infirmary, Mr. W. T. Hatch, Engineer, Metropolitan Asylums Board, Victoria-embankment; additions to hospital, Mr. W. E. Davis, architect, 13, John-street, Adelphi, W.C.

Chippingham (Wilts).—Office block. Mr. G. Rigg, Frome.

Croydon.—Eight houses, Coniston-road. Mr. E. Bates, architect, Imperial-buildings, Addiscombe-road.

Darlington.—School (10,000*l.*). Mr. G. Winter, Borough Engineer, Town Tall, Darlington.

Deepdale, Preston (Lancs).—School (7,000*l.*). Mr. T. Cookson, architect, Town Hall, Preston; Messrs. T. & R. Colley, builders, Preston.

Edinburgh.—Additions, Magdalen Asylum (2,000*l.*), Mr. J. A. Carfrae, 3, Queen-street, Edinburgh; block of flats and shops, Hamilton-place (4,060*l.*), Mr. F. Marwick, 43, York-place, Edinburgh; Home Industries' Brigade, Mr. A. H. Crawford, 10, Randolph-place, Edinburgh.

Flint.—Patent silk factory (50,000*l.*). Messrs. Briggs & Wolstenholme, architects, May-buildings, 51, North John-street, Liverpool, and Central-buildings, Richmond-terrace, Blackburn.

Harrow.—Twelve houses, Sussex-road. Messrs. A. E. Crook & Co., architects, Lowlands-road, Harrow.

Horwick (Lancs).—School (12,000*l.*). Mr. H. Littler, architect, 16, Ribblesdale-place, Preston.

Inverurie (N.B.).—Post-office (2,200*l.*). Mr. J. B. Mitchell, 148, Union-street, Aberdeen.

Kingston.—Adaptation of Clattern Lodge to Constitutional Clubhouse. Mr. E. G. Cooper, builder, Teddington.

Langley Park (Durham).—County school. Mr. W. Rushworth, Shire Hall, Durham.

Leven.—Workmen's Home (2,000*l.*). Mr. G. Campbell, architect, East Wemyss, Fifeshire.

Newark.—High School for Girls. Messrs. Brewill & Daily, architects, Parliament-street, Nottingham.

Newport (Isle of Wight).—School. Mr. P. Stone, architect, 33A, Holyrood-street, Newport, Isle of Wight.

Portadown (Ireland).—Public baths. Messrs. Hill & Kennedy, architects, Portadown.

Portobello (N.B.).—Municipal buildings (2,500*l.*). Mr. J. Williamson, Public Works Office, Edinburgh.

Ruabon (N. Wales).—Science school. Mr. W. Wiles, architect, High-street, Wrexham.

Rushden.—Co-operative factory. Mr. F. Harris, architect, Balloon-street, Manchester.

Southampton.—Alterations, Assembly Hall, Park-street, and alterations and additions, 52, Above Bar-street, Mr. A. A. Burnett, architect, 2, High-street, Southampton; additions, 51, Shirley-road, Messrs. Holt & Son, architects, 30, Shirley-road, Southampton; six houses, Wilton-road, Mr. F. W. Young, builder, 124, Clovelly-road, Southampton; conversion of Nos. 3 and 4, Council-buildings, into tenements, Mr. J. A. Crowther, Borough Engineer; alterations and additions, Western District School (6,327*l.*), Messrs. Golding & Ancell, builders, Park-road, Freemantle, Southampton; three houses and shops, Commercial-road, and two houses, Charlton-road, Messrs. Jurd & Sanders, architects, 23, Portland-street, Southampton; four houses, King Edward-avenue, and shop fronts, 173 and 174, High-street, Messrs. Mitchell, Son, & Gutteridge, architects, 9, Portland-street, Southampton; workshop, Foundry-lane, Messrs. Weston & Burnett, architects, 24, Portland-street, Southampton; workshop, Sidney-place, Mr. A. E. Jukes, builder, Richmond-road, Southampton; two houses, Heysham-road, Mr. G. R. Long, builder, Belmoor-road, Shirley, Southampton.

Strathspey (N.B.).—Additions to Free church (2,000*l.*). Mr. A. Mackenzie, architect, Kingussie, N.B.

Twyford (Berks).—Additions to church. Mr. Slingsby Stallwood, architect, 27, Market-place, Reading.

Tynemouth.—Y.M.C.A. premises (5,000*l.*). Mr. C. B. Plummer, architect, 13, Grey-street, Newcastle-on-Tyne.

Whitefield (Lancs).—Grammar school. Mr. H. Littler, architect, 16, Ribblesdale-place, Preston.

Whitehaven.—School (10,000*l.*). Messrs. Oliver & Dodeson, Lowther-street, Carlisle.

Wing (Bucks).—Cottages for Mr. Leopold de Rothschild. Mr. F. Taylor, Aylesbury.

Wrexham.—Church institute (4,000*l.*). Messrs. Prothero & Phillot, architects, Cheltenham; Messrs. Samuels & Sons, builders, Wrexham.

LONDON BOROUGH COUNCILS.

Bethnal Green.—Mr. A. F. Wrightson, F.S.I., who has been appointed to prepare the bills of quantities for the new municipal buildings, asked that the remuneration be 1¼ per cent. and be based upon the amount of the lowest tender received for the erection of the buildings, or, if no tender is sent in, on the architect's approximate cost of the erection. It was proposed by the Council that the remuneration should be 1¼ per cent. on the amount of the tender accepted. The General Purposes Committee considered the matter, and reports that it is reasonable to anticipate that satisfactory tenders will be received, and as the local authority has determined to proceed with the buildings it is unlikely that the Council will decline to accept one of the tenders. Under these circumstances the Committee have agreed to the proposal put forward by Mr. Wrightson.

Camberwell.—Two hundred and twenty-two local residents are endeavouring to get the four adjoining Councils to establish an underground convenience at the Crystal Palace-parade. The London County Council is to be urged to provide convenience accommodation in Peckham Rye Park. Woodwarde-road is to be paved as a new street at an estimated cost of 3,954*l.*

Chelsea.—The work of reconstructing Stanley Bridge by Messrs. Dick, Kerr, & Co., Ltd., has been commenced. Upon a suggestion of the London County Council, the plans for the erection of dwellings on the Grove-cottages site has been amended to provide for further ventilation and alterations of the sanitary arrangements. The cost of the variations is estimated at 141*l.*

Fulham.—The Electricity Committee record appreciation of the efficient manner in which the Electrical Engineer organised the arrangements during the heavy Christmas loads, which were considerably in excess of any previous record. Wherever it is necessary to renew the existing electric street lamps, Osram lamps are to be substituted. The practice of fixing electric rising mains in blocks of flats is to be extended to maisonettes on application from the tenant of an upper floor. In reply to a communication from the Finance Committee of the London County Council, pointing out that 1,719*l.* is a very small sum to have as a reserve to the electricity undertaking, it is pointed out by the local authority that the whole of the machinery is insured and maintained in a thoroughly efficient state out of revenue.

Hampstead.—A portion of Church-row has been widened at a cost of 442*l.* A proposal to continue the widening was rejected by the Borough Council at their last meeting.

Islington.—Shepperton-road is to be repaired with macadam, at an estimated cost of 217*l.* Creosoted deal blocks are to be substituted for asphalt macadam in front of the Guardians' offices in St. John's-road, at an estimated cost of 385*l.* Morgan-road is to be made up and paved.

Kensington.—Trees are to be planted on the southern side of Bayswater-road from Broad-walk to Kensington Palace Gardens-mews. Provision is to be made in the estimates of the ensuing financial year for painting and repairing works at the baths, to cost 166*l.*

Marylebone.—The Council are to apply to the London County Council for a loan of 8,000*l.* to carry out the necessary work involved in installing electric light in substitution for gas in 1,964 street lamps. Tenders are to be invited for the lamps, switches, lanterns, etc., in connexion with the scheme. The quarterly revenue account of the electricity undertaking shows 1,692*l.* 5s. 2d. reduction in costs, against a fall in the income of 1,117*l.* 13s. 7d. The balance to meet capital charges is greater by 614*l.* 9s. 10d., compared with the same quarter 1907. The Improved Wood Paving Company, Ltd., are to supply wood blocks for paving portions of the carriageway of Devonshire-street and Lisson-grove, at 6*l.* 16s. per 1,000 3 in. by 5 in. by 9 in. creosoted blocks. The Central Electric Supply Company are to construct a 5-ft. cable subway under Oxford-street from Gt. Cumberland-place to Park-lane.

Paddington.—The proposed sale of the Queen's-road baths and washhouses to Messrs. William Whiteley, Ltd., has been advanced a further stage, the Committee in charge of the matter having approved of a provisional agreement being entered into with the firm for the purchase of the property and site for 60,000*l.* The permission of the Local Government Board is required, and until this is granted no definite action is to be taken to secure a new site for the provision of other baths in the borough. The Committee point out that the 60,000*l.* is more than sufficient to cover the estimated cost of purchasing a new site and erecting premises thereon, and will provide additional and up-to-date accommodation. The offer, they go on to say, is more than the original cost of the site, buildings, engineering and other plant, and furniture. The Queen-street premises have been in use now for over thirty-four years. The Works Committee have decided in favour of the following items for wood paving being included in the forthcoming annual estimates, and that the work be carried out during 1909:—Bayswater-road, 12,230*l.*; Grand Junction-road, 7,500*l.*; Maida-vale, 4,500*l.*; Connaught-street, 1,800*l.* To obviate the necessity of continually taking up portions of the footways on the occasions of Royal and other processions, cast-iron boxes to hold Venetian masts, etc., are to be placed along the route usually taken. The cost is estimated at 70*l.*

Shoreditch.—In accordance with the policy laid down by the Borough Council in March, 1907, to purchase the freehold interests of the houses on the Stonebridge Estate as favourable opportunities arise, Mr. Kyffin's interest in houses in Dunstan-street and Loanda-street are to be acquired by the Housing Committee at a cost of 1,320*l.*

Southwark.—Dr. Waldo, the Coroner, has suggested that the Borough Council should provide proper mortuary accommodation adjacent to the Coroner's Court. The matter is to be considered by the Public Health and Sanitary Committee.

Stoke Newington.—The footway on the west side of Green-lanes is to be paved with *in situ* clinker, at an estimated cost of 180*l.* In reference to the Borough Council's application to borrow 1,150*l.* for public baths, the Local Government Board will hold an inquiry into the matter.

METROPOLITAN ASYLUMS BOARD.

At the fortnightly sitting of the Metropolitan Asylums Board on Saturday last week, the following matters were dealt with:—

Children's Infirmary.—A letter was received from the Local Government Board approving of the proposal to provide accommodation for vehicles at the Children's Infirmary, and agreeing to a contract being entered into without previously advertising for tenders.

Electricity v. Gas.—The Finance Committee submitted a report on the financial results of the substitution of electric light for gas, and stated that the figures showed that after allowing for all charges, including depreciation of plant, replacement of capital, there was a saving by the use of electricity. The Committee added that whilst they are satisfied that the substitution of electricity for gas has been generally economical, it must not be inferred that they were prepared to say at the present time, when improvements were being effected in the methods of consumption of both gas and electricity, that their relative positions would be maintained.

Laundries.—The Works Committee was instructed to provide for the alterations necessary at the several laundries of the Board to comply with the Factory and Workshops Act, and to see that the inside walls, ceilings, passages, and staircases were limewashed every fourteen months.

Leavesden Asylum.—The Asylums Committee reported that it is proposed that the work of washing down and touching up the internal walls of this institution, and distempering ceilings, shall be carried out again this year in accordance with the scheme approved in 1903. It was also referred to the Works Committee to carry out the provision of additional water-closet and storage and scullery accommodation for ward 13.

South-Western Hospital.—It was resolved to carry out the work of remodelling the internal telephone and fire-alarm systems at this hospital at an estimated cost of 500*l.*

Obituary.

MR. JAMES NEALE.

We regret to announce the death, on January 18, at his residence, No. 10, Bloomsbury-square, W.C., of Mr. James Neale, F.S.A., architect and surveyor, in his 59th year. Mr. Neale was Pugin Student, 1875, and Institute Medallist (Drawings), 1876. He was an assistant in Mr. G. E. Street's offices; he was elected an Associate in 1875, and a Fellow in 1890, of the Royal Institute of British Architects; he became a member of the Architectural Association in 1872. Mr. Neale was the author of a splendid monograph publication on St. Albans Cathedral, including most careful and accurate measured drawings of every portion of the building. Of his architectural plans and designs we have illustrated the following:—Ennismore-gardens, Dover, and houses at Rosslyn-hill, Hampstead (June 16, 1888); houses on the beach, Walmer, and an entrance lodge, Walmer (October 15, 1887); St. Peter's Church, Bushey Heath, Herts, for which he designed also the reredos—July 25, 1891 (chancel), May 20, 1893 (two views), and November 24, 1894; and "Compton Leigh," Frognal-gardens, Hampstead (January 27, 1894). He was the architect of several other residences in Hampstead and Frognal, one of them (1891) being for the late Sir Walter Besant in Frognal-gardens, and at Tunbridge Wells; also of a cottage residence at Southwater; alterations and additions at Nos. 2 and 19, Montague-place, W.C.; and at No. 5, Bedford-square, W.C., for Dr. J. H. Barker; and, in 1903, for the extensive improvements, with enlargement, etc., carried out at No. 54, Doughty-street, W.C., for Colonel S. Sanderson, and at Shenley Hill House for Mr. F. W. A. Hore. Eight years ago Mr. Neale was employed by Colonel G. A. Petter for the laying out of the New Malden Station estate, Surrey, and to superintend the construction, at a cost of about 12,000*l.*, of the first portion of the roads and sewers upon the property.

MR. J. L. MURRAY.

The death is announced of Mr. John L. Murray, of Heavyside, Biggar, N.B. Mr. Murray became a member of the Glasgow Institute of Architects in 1887. He prepared the plans and designs of the Public Hall at Law, Lanarkshire, comprising a hall with a capacity for 400 persons, and a smaller hall adapted for use as a library.

General Building News.

WESLEYAN METHODIST CHURCH AND SCHOOLS, OLD COLWYN.

Plans for the proposed first portion of this work have been passed by the trustees, and the estimate of Mr. J. O. Davies, Colwyn Bay, has been accepted. The design shows a large school-church, with two transepts and chancel, vestries, etc. Local stone will be used for the walls, which will be finished in roughly-squared stones, the roof will be entirely open, with pitch-pine roof trusses and green Welsh slates will be used for the roof covering. A quaint timber porch will be placed at the public entrance. This school-church will work out at an exceedingly low cost per sitting, and is the beginning of a much larger scheme, the designs for which have been sketched out, and which will comprise a large church of local stone, with bell-tower, etc. The architects for the work are Messrs. J. M. Porter & Elcock, the Estate Office, Colwyn Bay.

SCREEN, LANDRAKE CHURCH.

A parclose screen was dedicated on the 18th inst. at the Church of St. Peter, at Landrake. Like the surroundings generally, it is of the Perpendicular style, and constructed of seasoned English oak. Consisting of five distinct bays, double doors give a direct communication through it from the nave to the lower part of the belfry. The lower arch is rather more than 12 ft. wide, and the screen stretches from wall to wall (north to south), and is about 9 ft. in height. The lower part consists of plain panelling, but above the uprights is carved and pierced tracery work, the whole being surmounted by cresting. All the open parts are glazed by lead lights, the metal being gilded. The work was carried out by Messrs. Harry Hems & Sons, of Exeter.

CHURCH SCHOOLS, WILLENHALL.

In connexion with St. Giles's, Willenhall, new schools have been erected at a cost of about 4,500*l.* The premises are designed on the central-hall principle, to accommodate 400 children, and consist of a central hall, seven classrooms, headmaster's-room, and usual cloakrooms, etc. A feature of the design has been the arrangement of the rooms so that they can all be thrown into one large room. Externally the buildings are faced with Ruabon bricks and red terra-cotta dressings. The architects were Messrs. Johnson & Baxter, of Willenhall and Bilston; and the contractor Mr. John Tildesley, builder, Portobello, near Wolverhampton.

COUNCIL SCHOOL, BOLTON.

The Brandwood-street Council school, at Daubhill, Bolton, has just been opened. The building is of three stories, and provides accommodation for 1,230 children (viz., infants 410, juniors 420, seniors 400), and a staff of teachers for that number. The infants' department is on the ground floor, the first floor is allotted to the junior mixed, and the senior mixed occupy the second or top floor. The building is of brick, faced with Accrington facings and buff terra-cotta dressings. The construction throughout is fireproof. Mr. R. Mosley, Bolton, was the contractor, and carried out the whole of the work in accordance with plans and specifications prepared by and under the supervison of Mr. D. Campbell, the Education Committee's Architect, who was assisted by Mr. R. Dickinson, clerk of works.

CHURCH HOUSE EXTENSION, GRAVESEND.

The church house of St. George's, Gravesend, has been enlarged. The work was carried out from the plans of Messrs. Bridgland & Clay by Mr. W. H. Archer, builder.

VILLAGE INSTITUTE, ROBERTSBRIDGE, SUSSEX.

This building, just completed, was opened on the 6th inst. It comprises a large hall arranged for theatrical performances, and capable of seating 200 persons comfortably, a large billiard-room, games-room, library, and other accommodation. The building conforms with the style of the bulk of the houses in Robertsbridge, and the roof is covered with handmade local tiles. Mr. S. Harvey, of Rye, was the builder, and Mr. James Gray, of Chelsea, provided the heating installation. Mr. George Hornblower is the architect.

RECONSTRUCTION OF DUFF HOUSE.

The mansion of Duff House, which was presented to the communities of the burghs of Banff and Macduff some two years ago by the Duke of Fife, is to be converted into a hotel, the building having been leased to a London company known as the Banff Syndicate for a period of ninety-nine years. The alterations that will have to be made will involve, it is estimated, a sum of 20,000*l.* Messrs. Sutherland & George, of Aberdeen, are the architects of the scheme.

INSTITUTE PREMISES, NOTTINGHAM.

Plans have been approved by the Corporation of a new building designed to serve as an institute, which the Wesleyan community of this town propose to build. The plans have been prepared by Mr. A. E. Lambert, and the buildings will be constructed of fireproof materials, and will comprise four floors and a mezzanine floor.

PROPOSED FACTORY, FLINT.

It is reported that Messrs. Briggs & Wolstenholme, architects, of Liverpool and Blackburn, are commissioned to draw plans for the erection of big works at Flint, on the Cheshire border of the water, for manufacture by a German firm of a patent lustre silk. The cost of building will be about 50,000*l.*

Appointment.

TRIBUNAL OF APPEAL UNDER LONDON BUILDING ACT.

We are informed that Mr. John Slater, F.R.I.B.A., has been appointed to fill the vacancy on the Tribunal of Appeal caused by the death of Mr. E. A. Gruning. Both in regard to practical knowledge and high character for judicial impartiality there could not have been a better selection.

Sanitary and Engineering News.

LONDON'S WATER SUPPLY.

The new covered reservoirs at Honor Oak will shortly be opened. The works were commenced in 1898, and the undertaking has cost 220,000*l.*, inclusive of the land. The reservoir, which covers 21 acres, has a storage capacity of 56,500,000 gallons, and is divided into four compartments, two of which will hold about 16,000,000 gallons. It will derive its supply principally by means of a 42-in. main from the Hampton works of the Metropolitan Water Board, but water will also be obtained from a deep well in the chalk. Arches will cover in the reservoir, and above the roof it is intended to plant grass-seeds. The depth of the compartments ranges from 20 ft. to 33½ ft. At the centre of the four reservoirs, where the division walls intersect, is the central well, from which the charging and emptying will be directed. By means of special connexions it will be possible to work each or every reservoir at the same time without interfering with the others. The works were designed by Mr. J. W. Restler.

PROPOSED NEW SEWAGE SCHEME, ROMFORD.

Mr. A. W. Brightmore, S.Dc., M.Inst.C.E., Local Government Board Inspector, held an inquiry recently into an application by the Romford Rural District Council for sanction to borrow sums amounting to 3,050*l.* for works of sewerage and sewage disposal. The scheme comprises the drainage of Abbs Cross and the enlargement of the present sewage disposal works. Details of the proposed works were given by Mr. W. J. Grant, the Surveyor.

Miscellaneous.

SALE OF OLD-ENGLISH FURNITURE.

In a recent sale by Messrs. Chesterton & Sons were included some specimens of Chippendale furniture, being two bookcases (400*l.* and 100*l.*), a carved wardrobe (72*l.*), a pair of chairs with ornamental carving and open interlaced backs (40 guineas), and an oval jardinière (37*l.*). The Sheraton work comprised a writing-table (50*l.*), a pair of card-tables (47*l.*), and a pair of small open wall-bookcases (51*l.*). An Adam suite of twelve arm-chairs and three occasional chairs, with a settee was disposed of for 163*l.*

THE CONCRETE INSTITUTE.

At a meeting of the Council of the Concrete Institute, held on Thursday, the 14th inst., Sir Henry Tanner in the chair, it was decided that all new members resident in Great Britain—joining after the enrolment of the first 500 members—should be subject to an annual subscription of 2 guineas, instead of the present subscription of 1 guinea, which latter subscription will, however, still be retained for new Colonial and foreign members. The membership of the Institute already exceeds 400. A number of appointments to the Standing Committees of the Institute have now been made. The Committees on science, on Parliamentary matters, on mass concrete, and on tests, have respectively as chairmen, Mr. William Dunn, F.R.I.B.A., Mr. A. Ross, M.Inst.C.E., Mr. C. H. Colson, M.Inst.C.E., and Mr. W. T. Hatch, M.Inst.C.E.; and the following are acting as Hon. Secretaries to various Standing Committees, *i.e.*, Mr. F. E. Wentworth-Shields, M.Inst.C.E. (Science), Mr. J. E. Franck, A.R.I.B.A. (Parliamentary), Mr. G. Kirkaldy, A.M.Inst.C.E. (Tests), and Mr. R. W. Vawdrey, B.A. (Reinforced Concrete Practice).

GLASGOW ARCHITECTURAL CRAFTSMEN'S SOCIETY.

The sixth meeting of the session of the Architectural Craftsmen's Society was held on the 15th inst. in the Technical College, Glasgow, Mr. J. Campbell Reid in the chair. Mr. Robert Murdock, F.S.I., delivered a lecture on "Contracts and Contracting." He pointed out that Glasgow had been singularly free from building accidents due to imperfect work, a fact which reflected great credit on the Dean of Guild Court and Master of Works. He traced the influence of the Employers' Liability Act on contracts, and said that prior to the Reform Act no builder was allowed to practise his craft unless he was a member of the Society of Incorporated Masons. Mr. Murdoch strongly advocated the general adoption of a uniform method of making out schedules of quantities.

THE CITY WALLS OF YORK.

A meeting of the York Archæological Society was held on the 12th inst. to consider the question of St. Mary's Abbey walls, which are the property of the York Corporation. Mr. R. B. Cooke presided. Mr. H. M. Platnauer gave a short history of the Abbey walls, and explained that in post-Dissolution days permission was given for the filling up of the ditch outside and for the building of tenements on the filled-up ditch. Most of these were now demolished, there only remaining two cottages on the wall in Marygate, and the question of the preservation of the walls as part of the city's antiquities would have to be dealt with shortly. It was decided that a sub-committee should be formed to formulate a scheme for dealing with the walls, to be submitted to a future meeting of the Society, who will make a recommendation to the City Council on the subject.

HOME SECRETARY AND ASYLUM CONTRACT.

At a recent meeting of the Essex County Council the County Lunatic Asylums Committee reported that the Home Secretary had refused to sanction the contract of Messrs. Waring & White, Ltd., of Cockspur-street, London, for the erection of the superstructure of the new asylum at Colchester. The amount of the contract was 191,545*l.*, and this was accepted by the Committee some months ago. The reasons for the Home Secretary's refusal were:—(1) That the tender was not the lowest; (2) that other firms were not afforded the same opportunity of reconsidering their tenders as was afforded to Waring & White; and (3) that the acceptance of Waring & White's tender involved a system of sub-contracting which, in Mr. Gladstone's opinion, was in itself open to serious objection. The Asylums Committee reported that further correspondence had ensued between them and the Home Office, and it had been pointed out that Waring & White were on the contractors' lists of the Admiralty and Navy; while Waring & White wrote stating that as they looked upon the consent of the Lunacy Commissioners and the Home Office as being in the nature of a formality, and as they were anxious to commence the work without delay, they had already incurred liabilities amounting to approximately 300*l.*—Sir Thomas Barratt Lennard characterised the action of the Home Secretary as unwarranted and, he believed, unprecedented. He thought the Council would agree with him that the Home Secretary was exercising his right in an unreasonable manner, and was trying to force the Council, through its Committee, to adopt a contract the Committee did not approve of. It was the general, if not the universal, custom for contractors to take sub-contracts. Moreover, Waring & White undertook to put up workshops for the preparation of the joinery on the grounds, and to do the brickwork and carpenters' work themselves. The Committee felt, if the Home Secretary's decision was to be acquiesced in, there was no course for them but to resign, and on behalf of his colleagues and himself he tendered their resignations. After discussion the Council unanimously passed a vote of confidence in the Committee, whose resignations were then withdrawn. It was resolved to request the Home Secretary to receive a deputation from the County Council, consisting of the Chairman, Vice-Chairman, and three members of the Asylums Committee. —*Morning Post.*

ANCIENT BRONZE.

Discussing the question of "Copper and Copper Alloys" at the meeting of the Institute of Metals in London, on Tuesday, Mr. A. B. Seaton (Birmingham) threw out the suggestion that the high quality of the bronzes used by the ancient Peruvians, Egyptians, and Greeks was due to the fact that people did not live in such a hurry in those days, and did not mind whether they took a week or a year so long as they obtained a good material.—Professor Gowland said he had analysed a considerable number of ancient bronzes, and found them full of impurities. They discovered in it everything found in very impure copper. He thought the hardness of the ancient bronze was entirely due to hammering.—Mr. Walter Rosenhein (National Physical Laboratory) remarked that if the makers of ancient bronzes took time over the cooling it would render them relatively brittle.—Mr. Seeton said his point was that they took a long time to heat the metals, as they had not the rapid processes which we had now.

Law Reports.

A DISTRICT SURVEYOR'S FEES UNDER THE LONDON BUILDING ACT.

THE case of Marsland *v.* J. Moran & Son, Ltd., came before a Divisional Court of King's Bench, composed of the Lord Chief Justice and Justices Bigham and Walton, on the 19th inst., on the appeal of Messrs. J. Moran & Son, Ltd., from a decision of Mr. Horace Smith, the stipendiary of the Lambeth Police Court. The case came before the Court upon a special case stated by the learned magistrate, and raised an important question as to the fees of a District Surveyor under the provisions of the London Building Act, 1894. The special case stated that Mr. Ellis Marsland, the respondent, summoned the appellants, builders and contractors, of Victoria-street, Westminster, for a sum of 29*7l.* 13*s.*, his fees for inspecting two new covered reservoirs erected by the appellants under contract with the Metropolitan Water Board on Honor Oak-hill, at Nunhead. By sect. 138 of the London Building Act, 1894, it is provided (*inter alia*) as follows:—"Subject to the provisions of this Act, and to the exemptions in this Act mentioned, every building or structure and every work done to, in, or upon any building or structure shall be subject to the supervision of the District Surveyor appointed to the district in which the building or structure is situate." By sect. 145 of the Act, it is provided:—(*a*) Where a building or structure or work is about to begin, then two clear days before it is begun . . . the builder or other person causing or directing the work to be executed shall serve on the District Surveyor a building notice respecting the building, structure, or work. Every building notice shall state the situation, area, height, number of stories, and intended use of the building . . . and the particulars of the proposed work, and the name and address of the person giving the notice, and those of the owner . . . and occupier of the building or structure or of its site. Sect. 154, subsect. 1, of the Act provided as follows:—"There shall be paid by the builder, or, in his default, by the owner or occupier, as the case may be, of the building or structure, in respect whereof the same are chargeable to every District Surveyor in respect of the several matters mentioned in Parts I. and III. of the third schedule to this Act the fees therein specified." Part I. of the third schedule to the said Act specified (*inter alia*) certain fees as payable to the District Surveyor in respect of new buildings. By sect. 201 (1) of the said Act, bridges, piers, jetties, embankment walls and retaining walls, and wharf or quay walls are exempt from the operation of Parts VI. and VII. of this Act. By sect. 5, subsect. 6, of the Act, the expression "new building" means (*inter alia*) "any building erected after the commencement of the Act, and any space between walls and buildings which is roofed or commenced to be roofed after the commencement of this Act." At the hearing of the summons the following facts were admitted:—(*a*) The appellants constructed, on behalf of the Board under the contract, two covered storage reservoirs of a cubical capacity of 2,900,000 and 2,769,000 cubic ft. respectively, and were in the course of constructing two other such reservoirs; (*b*) the Board were authorised, by virtue of the Southwark and Vauxhall Water Act, 1894, and by the Metropolitan Water Board Act, 1906, to construct the said covered storage reservoirs; (c) the reservoirs had a floor composed of concrete, and walls constructed of brickwork backed by concrete and earth, and were completely covered in by a series of brick arches supported by brick piers 20 ft. high. The said brick arches were covered with a layer of concrete, which in its turn was covered with earth. The respondent stated that he was never supplied officially with copies of any of the Parliamentary or other plans, but that a plan was given to him by a member of the Institution of Civil Engineers. Before commencing the work the appellants gave notice, as required by sect. 145 of the London Building Act, 1894, to the respondent that they were about to carry out the construction of the reservoirs; but the appellants never in any way consulted the respondent in relation to the said works after giving the notice. The respondent surveyed the premises in the ordinary course of his duties during the two years they were in the process of construction. On behalf of the appellants, it was contended that the storage reservoirs in question were not buildings or structures within the meaning of sects. 138 and 154 of the London Building Act, but were in the nature of embankment or retaining walls, and that the reservoirs, having been constructed under the powers of the special Acts of Parliament before mentioned, were not subject to the provisions of the London Building Act, nor to the supervision of the respondent, inasmuch as the provisions of the said special Acts were inconsistent with the London Building Act. In particular, it was contended that this was so, since but for the special Acts the reservoirs in question could not have been built at all. On behalf of the respondent it was submitted that the reservoirs were buildings or structures, and therefore he was entitled to his fees. The magistrate gave judgment in favour of the respondent upon the ground that the reservoirs were buildings in fact, and that in law they were buildings coming within the scope of the London Building Act, 1894, and that the respondent was entitled to his fees. The

LAW REPORTS.—*Continued on page* 104

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —; Contracts, iv. vi. viii. x.; Public Appointments, xviii.; Auction Sales, xxvi.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Competition.

MARCH 31. — **Middlesbrough.** — NEW LIBRARY.— The Free Library Committee invite plans for proposed new Library to be erected in Dunning-road and Grange-road, East Middlesbrough. Premiums of 50*l.*, 30*l.*, and 20*l.* Conditions, with plan of site, may be obtained on application to Mr. Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit, 2*l.* 2s. For further particulars see advertisement in our issue of December 26.

Contracts.

BUILDING.

JANUARY 22.—**Ynysddu.**—SCHOOLROOM.—Tenders are invited for the erection of a schoolroom at Ynysddu for the Sardis Congregational Church. Plans, etc., can be seen at Mr. David Thomas, Mount Pleasant, Ynysddu.

JANUARY 25.—**Coventry.**—WALL, ETC.—The Education Committee invite tenders for the erection of a wall and other works at the Frederick Bird School, Swan-lane. Plans, etc., may be inspected at the office of the architects, Messrs. G. and I. Steane, 22, Little Park-street, Coventry.

JANUARY 25. — **Milnsbridge.** — HOUSES.—Erection of two dwelling-houses, Cowlersley-lane, Milnsbridge. Mr. Joe Ainley, architect and surveyor, Chapel-street, Slaithwaite.

JANUARY 25.—**Morley.**—ALTERATIONS, ETC., TO MILLS. —Alterations and additions to Prospect Mills, Morley. Plans, etc., may be seen, and a copy of the quantities obtained, at offices of Mr. T. A. Buttery, F.I.A.S., 1, Basinghall-square, Leeds, and Queen-street, Morley.

JANUARY 26.—**Bedford.**—PAVILION.—Tenders are invited for the construction of a refreshment pavilion, at Russell Park, Bedford. Plans, etc., may be seen, and quantities, etc., obtained, upon application at the Borough Surveyor's Office, Town Hall.

JANUARY 26.— **Bradford.**— MORTUARY.— Bradford Corporation invite tenders for plasterers' and concretors' work required in the erection of public mortuary, Wilton-street. Drawings and general conditions may be seen, and bills of quantities and forms of tender obtained, on application to the City Architect, Whitaker-buildings, Brewery-street, Bradford.

JANUARY 26.—**Dukestown.**—CHURCH.—Erection of a new church at Dukestown, Tredegar. Plans, etc., may be seen at the office of the Architect, Mr. A. F. Webb, High-street, Blackwood.

JANUARY 26. — **Eastbourne.** — BOWLING GREEN PAVILION.—The Pleasure Grounds Committee invite tenders for the erection of a pavilion at the bowling green near the Redoubt. Plan, etc., may be seen, and form of tender obtained, at the Borough Surveyor's office, Town Hall.

JANUARY 26. — **Edinburgh.** — CONCERT HALL.—The Directors of the Edinburgh Marine Gardens, Ltd., invite tenders for the erection of a concert hall. All particulars can be obtained and plans seen at the offices of Messrs. Walker & Ramsay, architects, 123, Wellington-street, Glasgow; or Mr. Jas. D. Gibson, surveyor, 60, Frederick-street, Edinburgh.

JANUARY 26. — **Milnsbridge.** — HOUSES.—Erection of twelve houses in Bowling-street and Cassonstreet, Milnsbridge. Plans may be seen, and quantities obtained, at offices of Messrs. Lunn & Kaye, architects and surveyors, Milnsbridge and Huddersfield.

JANUARY 26.—**Wigan.**—COTTAGES.—The Corporation of Wigan invite tenders for the erection of fifty cottages on land adjoining the car-sheds, Melverley-street. Plans, etc., and any other particulars, may be obtained on application at the office of the Borough Engineer, King-street West, Wigan.

JANUARY 27.—**Aberdeen.**—EXTENSION OF PREMISES. —Mason, carpenter, plumber, iron, painter, plasterer, and slater works of extension of premises behind 151, George-street, for Mr. M. Isaac Benzie, warehouseman. Plans, etc., to be seen with, and schedules of quantities obtained from, the architect, Mr. Arthur C. Bruce, 124, Union-street, Aberdeen.

JANUARY 27.—**Huddersfield.**—PALACE THEATRE.— Excavators, masons and bricklayers, carpenters and joiners, plasterers and slaters, concretors, plumbers, and glaziers' work (one contract preferred) necessary in the erection of the Palace Theatre, Kirkgate, Huddersfield. Names to Messrs. Richard Horsfall & Son, 22A, Commercial-street, Halifax, with a deposit of 2*l.* 2s. for each trade.

JANUARY 27. — **Rednal.** — READING-ROOM. — King's Norton and Northfield U.D.C. invite tenders for the erection of a public reading-room at Rednal. Bills of quantities and forms of tender may be obtained upon application to the Engineer and Surveyor to the Council, Mr. Ambrose W. Cross, A.M.Inst.C.E., No. 23, Valentine-road, King's Heath, on payment of a deposit of 1*l.* 1s.

JANUARY 27.—**South Shields.**—ADDITIONS TO BATHS AND WASHHOUSES.—The T.C. invite tenders in connexion with the new boiler feed pump and steam mains at the baths and washhouses in Derby-street, South Shields. Part I., masons' work; and Part II., engineering work. Form of tender for each part, together with a copy of the bills of quantities, may be obtained on application to the architect, Mr. J. H. Morton, F.R.I.B.A., of 50, King-street, South Shields, and 57, Westgate-road, Newcastle-on-Tyne.

JANUARY 28.—**Antrim.**—COTTAGES.—Antrim R.D.C. invite tenders for building twelve single labourers' cottages and seven blocks of two each. Plans, etc., can be obtained on application to the Clerk of the Council, on payment of a fee of 5s.

JANUARY 28.—**Hambledon.**—ALTERATIONS, ETC.—The Board of Guardians of the Hambledon Union invite tenders for the carrying out of alterations and additions to an old building in order to provide additional accommodation for aged women at the Union Workhouse, Hambledon, Surrey. The plans, etc., can be seen on application to the Board's Architect, Mr. Edward L. Lunn, 36, High-street, Guildford.

JANUARY 28. — **Margate.**—LAVATORIES.—Construction of ladies' and gentlemen's lavatories. The plans, etc., can be seen, and all further particulars obtained, on application to the Borough Surveyor, 13, Grosvenor-place, Margate.

JANUARY 30.—**Elland.**—MILL.—For masons', carpenters' and joiners', plumbers' and glaziers', plasterers' and slaters', roof asphalters', concretors', ironfounders', steel merchants, painters', and reinforced concrete floor layers' trades in the erection of a four-storied fireproof mill, engine-house, etc., at Springwood Mills, Holywell Brook, Elland, for Messrs. R. & J. Holroyd. Plans, etc., will lay for inspection, and quantities may be obtained at the offices of Messrs. Chas. F. L. Horsfall & Son, architects, Lord-street-chambers, Halifax.

JANUARY 30.—**Kenfig Hill.**—SHOPS, ETC.—Erection of two shops and a dwelling-house (attached) at Evans-street, Kenfig Hill, for Mr. Thomas Nicholas, Victoria-buildings, Port Talbot. Plans, etc., may be seen at offices of Mr. Aneuryn T. James, architect and surveyor, 23, Station-road, Port Talbot.

FEBRUARY 1.—**Ledsham.**—HOUSES.—Tenders are required for the erection of four single houses and six semi-detached houses, with sixteen sets of farm buildings, near to Ledsham Station, Cheshire. Plans, etc., can be seen at office of the County Estate Office, 49, Northgate-street, Chester, and quantities obtained on deposit of 1*l.*

FEBRUARY 1.—**Leighton, Crewe.**—HOUSE, ETC.— Tenders are required for the erection of a single house and set of farm buildings at Leighton, near Crewe, Cheshire. Plans, etc., can be seen at office of the Land Agent, the County Estate Office, 49, Northgate-street, Chester, and quantities obtained on deposit of 1*l.*

FEBRUARY 1.—**Llyn Traffwll.**—ENGINE-HOUSE, ETC. —Holyhead Waterworks Company invite tenders for the construction of an engine-house, filter bed, cottage, and other works, to be situate at Llyn Traffwll. The drawings may be seen, and the specification, etc., obtained, on payment of 5*l.* 5s., at the office of Messrs. H. Rofe & Son, civil engineers, 8, Victoria-street, Westminster. Copies of the drawings may also be seen at the Waterworks Office, Stanley-street, Holyhead.

FEBRUARY 1.—**Machynlleth.**—NEW POST-OFFICE.— Tenders are invited for the erection of the above at Paternoster-buildings, Machynlleth, for Mr. R. Llewellyn Jones. Plans, etc., may be inspected on written application to Mr. R. W. Davies, architect and surveyor, Carno.

FEBRUARY 1. — **Melton Mowbray.** — ALTERATIONS, ETC., TO MARKET.—The U.D.C. of Melton Mowbray require tenders for alterations and additions to their cattle market. Quantities for the following sections of work, viz.:—No. 1, builders; No. 2, ironfounders; No. 3, painters, can be obtained on application at office of Mr. Edmund Jeeves, Surveyor, Nottingham-street, Melton Mowbray, by depositing 2*l.* 2s. for each section.

* FEBRUARY 2.—**Bristol.**—ENGINE-SHED, ETC.—The Great Western Railway Company invite tenders for a new engine-shed, etc., at St. Philip's Marsh, Bristol. See advertisement in this issue for further particulars.

FEBRUARY 2. — **Lambourn.** — STATION. — Great Western Railway Directors invite tenders for the erection of a new station building at Lambourn, Berks. Plans, etc., may be seen, and forms of tender, etc., obtained, at the office of the Engineer at Paddington Station, London.

* FEBRUARY 2. — **Westminster.** — REBUILDING.— Tenders are invited for rebuilding Nos. 16, 18, and 20 Strutton-grounds, Westminster. See advertisement in this issue for further particulars.

* FEBRUARY 3.—**Barnsley.**—ADDITIONS.—The Commissioners of H.M. Works, etc., invite tenders for additions to the Post-office at Barnsley. See advertisement in this issue for further particulars.

FEBRUARY 3.—**Pontypridd.**—Y.M.C.A. NEW BUILDING.—The Building Committee of the Pontypridd Y.M.C.A. invite tenders for the erection of a new building in accordance with drawings, etc., prepared by the architect, Mr. Vernon Hodge, London. The drawings, etc., may be inspected at the present Y.M.C.A. rooms on the site, Taff-street, Pontypridd. Quantities, prepared by the surveyors, Messrs. C. Pearson Shaw, Son, & Hemingway, Nottingham, can be obtained from Mr. Geo. W. Rankin, New Buildings Secretary, "Bronheulog," Church-place, Penarth, Glam., upon payment of a deposit of 2*l.* 2s.

FEBRUARY 6.—**Chilcombe.**—COTTAGE.—Erection of a coachman's cottage at Chilcombe, Bicknoller, near Williton, for the Rev. Cecil Martin. Drawings, etc., may be seen at offices of Mr. F. W. Roberts, F.R.I.B.A., architect, 2, Hammet-street, Taunton.

FEBRUARY 6.—**Scampton.**—CHAPEL.—Erection of a new chapel and classroom at Scampton. The plans, etc., may be seen either at Mr. Chantry's, Scampton; or the Rev. A. Morter's, 102, Burton-road, Lincoln.

FEBRUARY 6.—**Tonyrefail.**—HOUSES.—Erection of sixty houses and six shops on the Ynysyplwm Estate, Tonyrefail, for Messrs. the Ty'nycoed Building Club. Plans, etc., can be seen at the architect's office, Brynawel, Cilfynydd, Pontypridd. Mr. Philip J. Jones, architect, Cilfynydd, Pontypridd, and Tonyrefail.

FEBRUARY 8.—**Belfast.**—WAREHOUSES, ETC.—Erection of a building in Murray's-terrace and Athol-street, Belfast, consisting of three separate warehouses and a laundry for Messrs. the Belfast Linen Handkerchief Company, Ltd. Quantities have been prepared, and may be had on application to Mr. S. C. Hunter, 2, Wellington-place, Belfast, on payment of 3*l.* 3s. Plans, etc., may be seen at office of Mr. James A. Hanna, C.E., architect, Ocean-buildings, Belfast.

FEBRUARY 11.—**Llanfair P.G.**—SCHOOL.—Tenders are invited for the erection of a new Council School at Llanfair P.G. for the Anglesey Education Committee. Plans, etc., may be inspected at office of Mr. Jos. Owen, F.R.I.B.A., County Architect, Menai Bridge.

* FEBRUARY 12. — **Mayfair, W.** — ENLARGEMENT.— The Commissioners of H.M. Works, etc., invite tenders for enlargement of the Western District Parcel Office and Mayfair Telephone Exchange (second contract). See advertisement in this issue for further particulars.

* FEBRUARY 20. — **Redhill.**—SCHOOL.—The Reigate Education Committee invite tenders for an elementary school at Cromwell-road, Redhill. See advertisement in this issue for further particulars.

NO DATE.—**Colton.**—CHIMNEY, ETC.—Construction of an additional fireplace and chimney and other minor alterations at the Colton Provided School, near Leeds. Specification, etc., may be obtained from Mr. R. J. Smith, Education Offices, Garforth, near Leeds.

NO DATE.—**Forestfach.**—SHOPS, ETC.—New shops, bakery, and stables at Forestfach for the Cwmbwria Co-operative Society, Ltd. Names immediately to Messrs. C. S. Thomas, Meager, & Jones, architects, 16, Wind-street, Swansea.

* NO DATE. — **Hammersmith.** — CONCERT HALL.— Tenders are invited for erection of a small concert hall. See advertisement in this issue for further particulars.

NO DATE. — **Hawcoat.** — NEW WESLEYAN CHAPEL.— Work at the above chapel. Names to Mr. John Plumb, Tower House, Hawcoat, or to the architect, Mr. Jno. T. Henshaw, M.S.A., 155, Preston New-road, Blackburn, and 9, Grimshaw-street, Burnley.

NO DATE.—**Kelvedon.**—ALTERATIONS, ETC.—Tenders are required for the several alterations and additions to Prested Hall, near Kelvedon, for Mr. N. N. Sherwood. Plans, etc., may be seen at office of Mr. J. W. Start, F.S.I., architect and surveyor, Colchester, and bills of quantities may be obtained on deposit of 2*l.* 2s.

NO DATE.—**Tyersal.**—SLATER'S, ETC., WORK.—Tenders invited for the slater's, plumber's, and plasterer's work required for twenty-three houses, Akeroyd Park, Dick-lane, Tyersal. Apply Mr. I. F. Akeroyd, 31, Springfield-crescent, Lidget Green, or on the job.

NO DATE. — **Whitley Bay.** — ALTERATIONS, ETC. — Building and alteration of Redcar House, Whitley Bay. Plans, etc., may be seen on application at 51, Percy-road, Whitley Bay.

ENGINEERING, IRON, AND STEEL.

JANUARY 25.—**Aston Manor.**—AIR-LIFT PLANT.— Tenders are required for the fixing of air compressor, water and air pipes, at the Public Baths, Victoria-road, Aston Manor. Bills of quantities, and all information, can be obtained from Mr. F. W. Richardson, Borough Engineer and Surveyor, Council House, Aston Manor, on payment of 1*l.* 1s.

JANUARY 25. — **Glasgow.** — SHIELDHALL OUTFALL WORKS.—The Corporation of Glasgow invite tenders for the execution, under one contract, of the excavator, brick and mason, timber, and other works required in the construction of the superstructure of the machinery buildings, etc., at Shieldhall. Specifications, etc., may be had on application at

the Office of Public Works, City Chambers, 64, Cochrane-street, Glasgow, by depositing 5*l.* 5s. Plans, etc., may be seen, and further particulars obtained, at the office of Mr. Wm. D. Hamilton. M.I.Mech.E., 59, Bath-street, Glasgow.

JANUARY 25.—**Kidsgrove.**—ENGINE, ETC.—Kidsgrove U.D.C. invite tenders for the supplying and fixing of engine, boiler, and pumping plant for their waterworks. Further particulars can be obtained from the Council's Surveyor, Mr. F. C. Crimes, Kidsgrove.

JANUARY 26.—**Harrogate.**—ELECTRIC LIGHTING.—The Harrogate Corporation invite tenders from local contractors for wiring and fitting up electric light installations at the schools. Specifications and plans can be seen at the office of the Borough Electrical Engineer, 33, Swan-road.

JANUARY 29.—**Bristol.**—TIMBER-BUILT DOLPHINS, PORTISHEAD DOCK.—The Bristol Docks Committee invite tenders for the construction and maintenance for twelve months after completion of three timber-built dolphins, with pile foundations, at Portishead Dock. Copies of the specification, etc., can be obtained from Mr. W. W. Squire, Engineer, Engineer's office, Cumberland-road, Bristol, on production of a receipt showing that a deposit of 3*l.* has been paid to the Secretary of the Docks Committee, 19, Queen-square, Bristol.

JANUARY 30.—**Edinburgh.**—ELECTRICAL INSTALLATION.—Edinburgh Corporation invite tenders for the electrical installations at Torphichen-place Police-station, and at the Corn Market, Gorgie. The specifications, etc., can be obtained at the office of Mr. Frank A. Newington, Engineer, Electricity Supply Station, Dewar-place, on payment of a deposit of 1*l.* 1s. for each set.

FEBRUARY 1.—**Middlesbrough.**—FOOTBRIDGE.—North-Eastern Railway Directors invite tenders for the construction of a footbridge over the railway at Cargo Fleet-road crossing, Middlesbrough. Plan, etc., may be seen, and detailed quantities, etc., obtained on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York.

FEBRUARY 1.—**Wilmington.**—FOOTBRIDGE.—North-Eastern Railway Directors invite tenders for the construction and erection of a footbridge over the Hull and Hornsea Branch, near Wilmington. Plan and specification may be seen, and detailed quantities, etc., obtained, on personal application at the office of Mr. W. J. Cudworth, the Company's Engineer, at York.

FEBRUARY 3.—**Hemel Hempsted.**—NEW BORE HOLE.—The B.C. invite tenders for a boring at the Waterworks Pumping Station, Marlowes, Hemel Hempsted, Herts. Plans, etc., may be obtained at the office of Mr. Walter R. Locke, Corporation Waterworks Engineer, Town Hall, Hemel Hempsted, on payment of a deposit of 5*l.*

FEBRUARY 4.—**Manchester.**—IRON AND STEEL WORK.—Manchester Corporation Gas Committee invite tenders for the iron and steel work required in the extension of an elevated railway siding at their Gaythorn Station. General conditions, etc., can be obtained on application to Mr. C. Nickson, Superintendent, Gas Department, Town Hall. Drawings can be seen, and any other information obtained, on application to the Engineer, Mr. J. G. Newbigging, M.Inst.C.E., at his office, Rochdale-road Station.

FEBRUARY 8.—**London.**—STEEL, ETC.—Tenders are invited for the following work for the Central South American Mining Company:—Section A—Steel and ironwork for buildings 250 ft. by 100 ft., 200 ft. by 80 ft., and 150 ft. by 30 ft.; section B—two steam locomotives, forty wagons, and forty-eight miles of portable track. Plans, etc., can be had on written application only. A deposit of a 5*l.* Bank of England note will be required. Mr Bernard Long, Secretary, 219, Euston-road, London, N.W.

FEBRUARY 19.—**Headingley, Leeds.**—FILTER-BEDS.—Leeds Corporation Waterworks Committee invite tenders for the construction, completion, and maintenance of six new filter-beds, etc., being the second section of the new filter-beds at Headingley, Leeds. Copies of the conditions, etc., may be obtained at the office of the Waterworks Engineer, Municipal-buildings, Leeds, on payment of a deposit of 1*l.*

FEBRUARY 22.—**Johannesburg.**—STEELWORK, ETC.—The Municipal Council of Johannesburg invite tenders for the supply and delivery of fixtures, fittings, constructional steelwork, etc., for the proposed Municipal Abattoirs, Newtown, Johannesburg. Drawings, etc., may be obtained from Messrs. E. W. Carling & Co., St. Dunstan's-buildings, St. Dunstan's-hill, London, E.C., on deposit of 2*l.* 2s.

NO DATE.—**London.**—SALT-PANS.—The International Salt Company, Ltd., invite tenders for the construction and erection of salt-pans for making coarse and fine salt, with furnaces, hurdles, chimneys, stoves, and stores complete. Particulars as to numbers and sizes of pans, etc., may be had from the Secretary of the Company, 6, Lawrence Pountney-hill, London, E.C.

MISCELLANEOUS.

JANUARY 22.—**Reading.**—CARTING.—Berkshire C.C. invite tenders for daywork carting of macadam, and other materials for the main roads. Forms, etc., at the County Surveyor's Office, Bank-chambers, Cross-street, Reading, or on receipt of stamped addressed foolscap envelope.

JANUARY 25.—**Bourne.**—CARTING.—The R.D.C. of Bourne invite tenders for carting granite, etc. Forms of tender can be obtained from the District Surveyor, Mr. Thomas Lake, West-street, Bourne.

JANUARY 26.—**Warwickshire.**—CARTAGE.—Warwickshire C.C. invite tenders for the cartage of main road material from various railway-stations and wharves in the county, and for general team labour. Forms to be obtained from the County Surveyor, 6, Waterloo-street, Birmingham.

JANUARY 27.—**Hammersmith.**—BARGING HOUSE REFUSE.—The B.C. invites tenders for providing barges and barging away, for a period of one, two, or three years, house refuse. Copies of the general conditions and forms of tender may be obtained on application to the Borough Surveyor at the Town Hall.

JANUARY 27.—**Hove.**—FENCING.—Hove Corporation invite tenders for providing and fixing about 1,340 ft. lin. oak park fencing on the east side of Hove Park. Drawings, etc., may be seen, and forms of tender obtained, at the office of the Borough Surveyor, Mr. H. H. Scott, Town Hall, Hove.

JANUARY 27.—**Stanwix.**—SCAVENGING.—Carlisle R.D.C. invite tenders for the removal of the contents of the ashpits, etc., in Stanwix Township. Also for watering the streets or roads in Stanwix Township. Further particulars from the Clerk, 7, Victoria-place, Carlisle.

FEBRUARY 1.—**Ledsham.**—FENCING.—Tenders are required for 3,000 yds. of creosoted fencing, 4 ft. high. Any further particulars apply to the Land Agent, the County Estate Office, 49, Northgate-street, Chester.

FEBRUARY 1.—**Northwich.**—SCAVENGING.—The U.D.C. of Northwich invite tenders for the removal and disposal of house refuse and nightsoil from the following districts, viz., Witton Ward East, Witton Ward West, Northwich Ward, and Castle Ward. Forms of tender on application at the Council Offices, Northwich.

FEBRUARY 1.—**Norwich.**—FENCING.—Tenders are invited for erection at St. Margaret's Churchyard, Norwich, of 339 ft. 6 in. of ornamental unclimbable wrought-iron fencing and gates to match, and 132 ft. 6 in. of ordinary unclimbable wrought-iron fencing and gate. Also for the erection at St. Swithin's Churchyard, Norwich, of 229 ft. 6 in. of ornamental unclimbable wrought-iron fencing and gates. Drawings may be seen, and specifications and forms of tender obtained, on application at office of Mr. Arthur E. Collins, M.Inst.C.E., City Engineer, etc., Guildhall, Norwich.

FEBRUARY 2.—**Rowley Regis.**—SCAVENGING.—The U.D.C. invite tenders for emptying ashpits, ashbins, etc., and removing the contents, in the Cradley Heath, Old Hill, Blackheath, Rowley Regis, and Tividale Wards, separately, for one, two, and three years. The specification, etc., are open to inspection during office hours at the Council Offices, Old Hill.

FEBRUARY 3.—**Ormskirk.**—SCAVENGING.—West Lancashire R.D.C. invite tenders for the emptying of ashpits, etc., in banks, in the Township of North Meols. Conditions may be obtained on application to Mr. James Peach, Sanitary Inspector, Knowsley-road, Ormskirk.

* FEBRUARY 3.—**Paddington.**—ALTERATIONS.—The Guardians of Paddington invite tenders for alterations at their Workhouse at 5, Woodfield-road, Harrow-road. See advertisement in this issue for further particulars.

FEBRUARY 4.—**Lambeth.**—HOUSE REFUSE REMOVAL.—The B.C. invites tender for the clearance and removal of house refuse from the houses in the Herne Hill, Tulse Hill, and Norwood Wards of the Borough. Specification, etc., may be obtained from Mr. Henry Edwards, C.E., Borough Engineer, Town Hall, Brixton Hill, S.W., on receipt of a stamped addressed foolscap envelope.

FEBRUARY 6.—**Chelmsford.**—TEAM LABOUR.—Essex C.C. invite tenders for team labour on the main roads for the year ending March 31, 1910. Particulars at the office of the Chief Surveyor, Chelmsford.

FEBRUARY 6.—**Stansted Parish Council.**—TENDERS FOR STREET LIGHTING.—Mr. Ernest R. Riches, Clerk, Stansted Parish Council, Central Hall, Stansted, Essex.

FEBRUARY 8.—**Boston.**—CARTING.—Holland C.C. Roads and Bridges Committee invite tenders for carting materials for the main roads in the north and south divisions of the county. Forms of tender may be obtained either from the District Main Road Surveyors, or Mr. H. Chaderton Johnson, Clerk of the C.C., Sessions House, Boston.

FEBRUARY 8.—**Glanford Brigg.**—LEADING ROAD MATERIAL.—The R.D.C. of Glanford Brigg invite tenders for leading road material. Forms of tender may be had on application at office of Mr. Frank C. Heft, Clerk, Brigg.

FEBRUARY 9.—**Potterspury.**—TEAM LABOUR.—The R.D.C. of Potterspury invite tenders for the carting of materials for road maintenance. Forms of tender, etc., are to be delivered, and all other information, may be obtained of Mr. J. B. Fairchild Potterspury, Stony Stratford, Surveyor to the Council.

FEBRUARY 15.—**Cerne.**—LABOUR.—Cerne R.D.C. invite tenders for the supply of manual and team labour and materials for three years. Specifications, etc., can be obtained on application to the Clerk to the D.C., Cerne Abbas, or to Mr. George Durden, surveyor, Hermitage.

PAINTING, etc.

* JANUARY 20.—**Homerton.**—PAINTING, ETC.—The Guardians of the Hackney Union invite tenders for external painting, etc., to cottages Nos. 35 to 68 (inclusive), Crozier-terrace, High-street, Homerton, N.E. See advertisement in this issue for further particulars.

JANUARY 25.—**Harrogate.**—PAINTING.—The Harrogate Corporation invite tenders for the work required in painting exterior of Kursaal and Spa Concert-rooms, Royal Pump-room and annexe, Magnesia Pump-room, swimming-baths, a portion of the interior of the Kursaal, and the Robert-street depôt. The specification may be seen, and particulars obtained, at office of Mr. F. Bagshaw, Borough Engineer and Surveyor.

JANUARY 27.—**Preston.**—PAINTING.—The Corporation invite tenders for the painting, etc., required to be done at the Police-station, Lancaster-road. Specification, etc., may be obtained at the office of the Borough Surveyor, Town Hall, Preston, on payment of 10s.

FEBRUARY 1.—**Warrington.**—PAINTING, ETC.—The Museum and Finance and Estates Committee of the Council of Warrington invite tenders for the painting and decorating of the Museum, Bold-street, also the Druids' Hall, Sankey-street, and the Academy, Bridge-street. Specifications, etc., may be seen, and forms of tender and all further information obtained, at the office of the Borough Surveyor, Town Hall.

ROADS, SANITARY, AND WATER WORKS.

JANUARY 26.—**Redcar.**—ROAD WORKS.—Redcar U.D.C. invite tenders for the following works, viz.:—(1) For levelling, paving, and making the back street between Aske-road and Lumley-road, Redcar; (2) for forming and paving a footpath from Coatham-road to a point south of the railway crossing in Kirkleatham-lane, Coatham, Redcar. Plans, etc., can be seen on application to Mr. James Howcroft, Surveyor, at No. 2, West-terrace, Redcar.

JANUARY 26.—**Salford.**—SEWERING.—Salford Corporation invite tenders for sewering, paving, and flagging certain streets. The plans, etc., may be seen, and forms of tender, with quantities, obtained, at the Borough Engineer's Office, Town Hall, Salford.

JANUARY 26.—**West Bradley.**—DRAINAGE.—Somerset C.C. Education Committee invite tenders for works in connexion with drainage at the West Bradley Council School. Plans, etc., can be seen at the School, or at the offices of Messrs. Cottam & Samson, Bridgwater, from whom any further information can be obtained.

JANUARY 27.—**Llantrisant and Llantwit Fardre.**—ROAD AND SEWER WORKS.—The R.D.C. invite tenders for:—(*a*) For widening and improving a portion of the district road between Efail Isaf and Pont Lydan; (*b*) for widening and improving a portion of the district road between the electric power-station and Upper Boat-road Bridge; (*c*) sewer extension at Trebanog; (*d*) the construction of sewerage and sewage disposal works for the village of Efail Isaf. Specifications may be seen, and bills of quantities, etc., obtained, from Mr. Gomer S. Morgan, Surveyor, School-street, Pontyclun, upon payment of a deposit of 1*l.* for each contract.

JANUARY 27.—**Twickenham.**—PRIVATE STREET IMPROVEMENT WORKS.—Twickenham U.D.C. invite tenders for the works in connexion with forming, levelling, kerbing, channelling, paving, metalling, and making good (1) Norcutt-road; (2) Warwick-road. Plans, etc., may be seen, and bills of quantities, etc., obtained, on application at the office of Mr. Fred W. Pearce, F.S.I., Surveyor to the Council, Town Hall, Twickenham, and the payment at office of Mr. H. Jason Saunders Clerk to the Council, Town Hall, Twickenham, of a deposit of 1*l.* 1s.

JANUARY 30.—**Monkseaton.**—SEWER.—Whitley and Monkseaton U.D.C. invite tenders for laying a 12-in. pipe sewer, etc., at Monkseaton. Plans, etc., may be seen, and bill of quantities, etc., obtained, at the office of Mr. A. J. Rousell, A.M.Inst.C.E., the Council's Surveyor, Council Offices, Whitley Bay, on deposit of the sum of 1*l.* 1s.

FEBRUARY 1.—**Sconser, Portree.**—DYKE.—Tenders wanted for erecting one and a half miles of "Galloway" dyke between Sconser Forest and Torrin Grazing. Line of proposed dyke will be pointed out by Mr. Alex. Campbell, Head Stalker, Sconser, Portree. Tenders, stating price per yard run, to be lodged by February 1 next with Factor, Macdonald Estates Office, Portree.

FEBRUARY 2.—**Pencisley.**—SEWERS.—Llandaff and Dinas Powis R.D.C. invite tenders for providing and laying about 1,300 yds. of 12-in. cast-iron and 140 yds. of earthenware pipe sewers, with manholes, etc., at Pencisley, in the Parish of Llandaff. Plans, etc., may be seen, and bills of quantities obtained, on application to the Engineer, Mr. James Holden, A.M.Inst.C.E., Park House, 20, Park-place, Cardiff.

FEBRUARY 3.—**Barking Town.**—PAVING.—The U.D.C. invite tenders for the execution of kerbing, channelling, flagging, etc., at Ripple-road. Plans may be seen, and specification, etc., obtained, from Mr. C. F. Dawson, Surveyor to the Council, Public Offices, Barking.

FEBRUARY 3.—**Failsworth.**—STREETS.—The U.D.C. of Failsworth invite tenders for private street improvement works. Plans, etc., may be seen, and forms of tender, with quantities, obtained at the Surveyor's Office, Town Hall, Failsworth.

FEBRUARY 4.—**Edinburgh.**—SEWER.—The Magistrates and Council invite tenders for the construction of a new 2-ft. by 3-ft. egg-shaped brick and concrete sewer for West Merchiston and Gorgie districts. Plans, etc., prepared by the Burgh Engineer, from whom schedules of measurement, etc., may be obtained.

FEBRUARY 6.—**Weston.**—SEWERS.—The R.D.C. of Runcorn invite tenders for the construction of about 500 yards of 9-in. sewers in Sandy-lane, Weston Point. Drawings, etc., may be seen, and form of tender obtained, at the Council Offices, 71, High-street, Runcorn.

NO DATE.—**Pontycymmer.**—GAS MAIN.—Garw and Ogmore Gas Company invite tenders for the laying of 900 yds. or thereabouts of 6-in. steel main. Specifications and form of tender can be obtained from Mr. R. B. Silcox, Engineer and Manager, Plas Offices, Pontycymmer, on payment of 1*l.* 1s. for each copy.

STONES, MATERIAL, AND STORES.

JANUARY 25.—**North Berwick.**—PIPES.—The Provost, Magistrates, and Councillors of the Burgh of North Berwick invite tenders for providing and delivering about 1,380 tons of 8-in. diameter dry-sand cast-iron pipes and special castings. Copies of the specification, etc., may be obtained at the office of the Engineers, Messrs. J. & A. Leslie & Reid, C.E., 72A, George-street, Edinburgh, and 9, Victoria-street, Westminster, S.W., on payment of 1*l.*

JANUARY 26.—**Diss.**—GRANITE.—Diss U.D.C. invite tenders for the supply of about 400 tons of XX broken granite, 1¼ in. to 1¾ in. gauge, 40 tons of XXX granite, 1 in. gauge, 50 tons of "siftings," and 30 tons of ¼-in. clean granite. Mr. Alfred Cooper, Surveyor, The Terrace, Diss.

JANUARY 26.—**Islington.**—PAVING BLOCKS.—The Metropolitan Borough of Islington invite tenders for the supply and delivery of creosoted deal paving blocks. Specification, etc., can be obtained upon application to the Borough Engineer, Mr. J. Patten Barber, at the Town Hall, Upper-street, Islington, N.

JANUARY 26.—**London.**—STEEL MATERIALS.—The Madras and Southern Mahratta Railway Company, Ltd., invite tenders for steel material, as per the specification, which may be seen at the offices of the Company. The charge for each specification is

1*l.* 1*s.*, which will not be returned. Mr. Percy A. Cory, *Pro* Secretary, 91, York-street, Westminster, S.W.

JANUARY 26.—**London.**—TOOLS, ETC.—Bombay, Baroda, and Central India Railway Directors invite tenders for the supply of miscellaneous tools and stores. Tenders must be made on forms, copies of which, with specifications, can be obtained at offices, Gloucester-house, 2, 3, and 4, Bishopsgate-street Without, E.C., on payment of 1*l.* 1*s.* each (which will not be returned).

JANUARY 27.—**Glasgow.**—STORES.—Glasgow and South-Western Railway Directors invite tenders for permanent-way stores. Detailed schedules, etc., can be obtained on application to Mr. R. F. Harrison, Stores Superintendent, Kilmarnock. Also wire fencing and erecting same, for particulars of which apply to the Company's Engineer, St. Enoch Station.

JANUARY 28.—**Fulham.**—UNBROKEN GRANITE.—The Guardians invite tenders for the supply of 600 tons of Guernsey granite spalls. Printed forms to be obtained at office of Mr. E. J. Mott, Clerk to the Guardians, Guardians' Offices, 129, Fulham Palace-road, Hammersmith, W.

JANUARY 28.—**Galston.**—CAST-IRON WATER PIPES.—Offers are invited for the supply and free delivery at Galston, Ayrshire, of 8-in. cast-iron pipes and special castings. Copies of the specification, etc., can be obtained from the engineers, Messrs. Elliott & Brown, Burton-buildings, Nottingham, on deposit of 1*l.* 1*s.*

JANUARY 28.—**Grays Thurrock.**—PIPES.—Tenders are invited for the supply and delivery of 435 lin. yds., or thereabouts, of stoneware pipes, and 500 lin. yds., or thereabouts, of concrete pipes. Full particulars, etc., may be obtained on application to the Council's Surveyor, U.D.C. Offices, Grays.

JANUARY 28.—**Tunbridge Wells.**—ROAD METALLING.—The Council of the Borough invite tenders for the supply and delivery of materials for road-metalling purposes. The material to be delivered during the ensuing year in consignments of not less than 250 tons at such times and quantities as required by the Borough Engineer, Mr. W. H. Maxwell, A.M.Inst.C.E.

JANUARY 29.—**Grimsby.**—MATERIALS.—The Corporation invite tenders for the supply of materials. Specifications, etc., may be obtained at office of Mr. H. Gilbert Whyatt. A.M.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Grimsby.

JANUARY 29.—**Richmond.**—MATERIALS.—Richmond (Surrey) T.C. invite tenders for the supply of timber in scantling, floorboards, etc., also galvanised-iron sheets, and other materials required in the erection of the new dressing-rooms, etc., in the Old Deer Park Recreation Ground. Mr. Henry Sagar, Town Clerk, Town Hall, Richmond, Surrey.

JANUARY 30.—**Amersham.**—FLINTS, ETC.—Amersham R.D.C. invite tenders for the supply and delivery of flints and granite in their district. Forms of tender may be obtained from Mr. L. Hilsden, Surveyor, Amersham.

JANUARY 30.—**Glasgow.**—PIPES.—The Corporation invite tenders for supplying about 1,150 tons of cast-iron pipes, varying from 12-in. to 3-in. in diameter. Drawings may be seen, and copies of the specification, etc., obtained, on application to Mr. J. R. Sutherland, the Engineer to the Water Department, at his office, 45, John-street, Glasgow.

JANUARY 30.—**Wrotham.**—ROAD MATERIALS.—Wrotham U.D.C. invite tenders for the supply of stone, also for the cartage of same. Conditions of contract may be inspected, and forms of tender obtained, upon application to Mr. F. T. Elliott, the Surveyor of the Council, at his office, Borough-green.

FEBRUARY 1.—**Birkenhead.**—STORES.—The Corporation of Birkenhead invite tenders for the supply and delivery of stores as required at the generating stations and tramway depôts of the Corporation during the year ending March 31, 1910. Particulars, etc., may be had, and samples inspected, on application to Mr. W. Wyld, M.Inst.M.E., M.Inst.E.E., Borough Electrical Engineer and Tramways Manager, at the Tramway Offices, Laird-street, Birkenhead.

FEBRUARY 1.—**Bourne.**—GRANITE AND SLAG.—The R.D.C. of Bourne invite tenders for the supply of about 6,000 tons of granite, and 2,000 tons of slag, at per ton. Forms to be obtained on application to Mr. Thomas Lake, District Surveyor, Bourne.

FEBRUARY 1.—**Bourne.**—TOOLS, ETC.—The R.D.C. of Bourne invite tenders for the supply of road-men's barrows, tools, etc. Particulars, etc., may be obtained on application to Mr. Thomas Lake, District Surveyor, Bourne.

FEBRUARY 1.—**Richmond (Surrey).**—STONEWARE PIPES.—The T.C. invite tenders for the supply of about 1,000 yds. of stoneware pipes. The conditions of contract may be inspected, and a copy of the specification, etc., obtained, on application to Mr. J. H. Brierley, Borough Surveyor, Town Hall, Richmond, Surrey.

* FEBRUARY 2.—**Brentford.**—GRANITE.—The Brentford U.D.C. invite tenders for 300 yds. of blue Guernsey granite, hand broken, to a gauge of 2 in. See advertisement in this issue for further particulars.

FEBRUARY 2.—**Carshalton.**—TOOLS, ETC.—The Metropolitan Asylums Board invite tenders for certain engineers' tools and workshop appliances, and a single-phase electric motor, at the Children's Infirmary, Carshalton, Surrey, in accordance with conditions of contract, etc., prepared by Mr. W. T. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief, which may be inspected at the Office of the Board, Embankment, E.C., and can be obtained upon payment of a deposit of 1*l.*

* FEBRUARY 2.—**Willesden.**—ANNUAL CONTRACTS.—The Willesden D.C. invite tenders for execution of works and supply of materials. See advertisement in this issue for further particulars.

FEBRUARY 4.—**Hounslow.**—STREET WORKS.—Heston and Isleworth U.D.C. invite tenders for:—(1) Making-up Campo-road, Hounslow; (2) making-up Ailsa-avenue, St. Margaret's. The plans, etc., may be seen, and bills of quantities, etc., obtained, from Mr. J. G. Carey, the Engineer and Surveyor to the Council, Council House, Hounslow, on payment of the sum of 1*l.* 1*s.*

FEBRUARY 4.—**Isle of Ely.**—GRANITE AND IRON SLAG.—The C.C. invite tenders for the supply of broken materials for the repair of main roads. Specifications, etc., can be obtained upon the receipt of a stamped addressed foolscap envelope at the offices of Mr. H. Farr Simpson, County Surveyor, Northern Division, Wisbech; Mr. R. S. W. Perkins, County Surveyor, Southern Division, Ely.

FEBRUARY 5.—**Sheffield.**—MATERIALS.—The Tramways Committee of the City Council invite tenders for the supply of general stores. Particulars and forms of tender, together with conditions of contract, may be obtained, and samples of general stores inspected, on application at the office of Mr. A. R. Fearnley, the General Manager, Tramways Department, Division-street, Sheffield.

FEBRUARY 8.—**Bethnal Green.**—ANNUAL CONTRACTS.—The Council invite tenders for the execution of works and supply of materials for one year. Copies of the specifications and forms of tender may be obtained on application to the Borough Engineer and Surveyor, at the Town Hall, Bethnal Green, N.E.

FEBRUARY 8.—**Birmingham.**—MATERIAL.—The Tramways Committee invite tenders for the supply of material. Conditions of contract and forms of tender may be obtained on application to Mr. Alfred Baker, General Manager.

FEBRUARY 8.—**Chesnunt.**—ANNUAL CONTRACTS.—The U.D.C. of Cheshunt invite tenders for the supply of materials. Specifications, etc., may be obtained on application to Mr. J. E. Sharpe, Engineer and Surveyor, Manor House, Cheshunt.

FEBRUARY 8.—**London.**—MATERIALS, ETC.—The Royal Borough of Kensington invite tenders for the work, materials, etc., for one year. Forms of tender may be had, and further particulars obtained, on application at the office of Mr. Wm. Chambers Leete, Town Clerk, Town Hall, Kensington, W.

FEBRUARY 8.—**Northwich.**—STORES.—River Weaver Navigation Trustees invite tenders for the supply of materials for the maintenance of the river. Schedules of approximate quantities and specifications may be obtained (on payment of 1*l.*) at the office of Mr. J. A. Saner, M.Inst.C.E., Engineer, Weaver Navigation, Northwich.

FEBRUARY 9.—**Lewes.**—ROAD MATERIALS.—East Sussex C.C. Roads and Bridges Committee invite tenders for the supply of materials, cartage, and team labour for the maintenance of the main roads in the West, South, Central, and East Districts of the county. Further particulars, etc., can be obtained on application to Mr. F. J. Wood, A.M.Inst.C.E., County Surveyor, County Hall, Lewes.

FEBRUARY 9.—**Potterspury.**—ROAD MATERIALS.—The R.D.C. of Potterspury invite tenders for the supply of granite (broken and unbroken) and slag for the year ending March 31, 1910. Forms of tender, etc., may be obtained on application to Mr. James B. Fairchild, Potterspury, Stony Stratford, the Surveyor to the Council.

FEBRUARY 10.—**Bradford.**—LIMESTONE.—The Bradford Corporation invite tenders for the supply of about 20,000 tons of road metal. Form of tender may be obtained on application at the office of Mr. W. H. S. Dawson, City Engineer and Surveyor, at the Town Hall.

FEBRUARY 10.—**Bradford.**—MATERIALS.—The Bradford Corporation invite tenders for the supply and delivery of articles. Forms of tender, etc., may be obtained on application at the office of Mr. W. H. S. Dawson, City Engineer and Surveyor, at the Town Hall.

FEBRUARY 12.—**Belfast.**—STORES.—Belfast and County Down Railway Directors invite tenders for the supply of stores for twelve months. Samples and patterns can be seen on application to the Storekeeper, Belfast Terminus.

FEBRUARY 13.—**Bath.**—MATERIALS.—The Somerset C.C. invite tenders for the supply of granite and basalt in lump; also macadam and chippings. Specifications, etc., can be obtained upon application to the County Surveyor, Bath.

FEBRUARY 13.—**Worcester.**—ROAD MATERIALS.—Worcestershire C.C. Highways and Bridges Committee invite tenders for the supply of road materials. Full particulars, etc., will be forwarded on application to Mr. J. H. Garrett, County Road Surveyor, Shirehall, Worcester.

FEBRUARY 17.—**Gloucester.**—MATERIALS.—Gloucestershire C.C. invite tenders for the supply of stone for the use on main roads for the year. Forms of tender can be obtained from the County Surveyor, Mr. E. S. Sinnott, M.Inst.C.E., Shire Hall, Gloucester.

FEBRUARY 22.—**Little Hulton.**—CONTRACTS.—The U.D.C. invite tenders for the supply of materials. Forms of tenders and particulars can be obtained from Mr. James H. Heyes, Clerk, Council Offices, Little Hulton, near Bolton.

Public Appointment.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
•DISTRICT ENGINEER FOR GOLD COAST	Crown Agents for the Colonies	See advertisement in this issue	Jan. 28

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
•MATERIALS OF OLD JACOBEAN BUILDING, ORPINGTON—On the Site	Eastman, Pierce, & Eastman	Jan. 27
•NURSERY STOCK, SOUTH WOODFORD—On the Premises	Protheroe & Morris	do.
•DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	do.
•BUILDING PLOTS, CARSHALTON—Greyhound Hotel, Croydon	Douglas Young & Co.	Feb. 4
•WOOD WORKING PLANT AND MACHINERY, BUNHILL-ROW, E.C.—On the Premises	Fuller, Horsey, Sons, & Cassell	Feb. 9
•FREEHOLD SITES, HAMPSTEAD—At the Mart	Furbers	Feb. 17

Capital and Labour.

EMPLOYMENT IN THE BUILDING TRADES.

Employment in December was slack in all parts of the United Kingdom. According to the *Labour Gazette*, it was worse than in November, and much worse than in December, 1907. At the end of the month a heavy fall of snow seriously interfered with building operations. With plumbers employment generally showed little change. Returns received from 715 firms employing 37,732 workpeople at the end of December show that there was a total decrease in the number of workpeople employed of 7·8 per cent. compared with a month ago, and of 12·0 per cent. compared with a year ago. The decline in employment as compared with both a month ago and a year ago affected every district. The percentage of trade union carpenters and joiners unemployed at the end of December was 15·9, as compared with 13·5 a month ago and 11·6 a year ago; and for plumbers, at the same dates, the percentages were 12·1, 12·0, and 9·0 respectively. In both cases the percentages for December, 1908, were highest in the Northern Counties and in Scotland, where many carpenters and plumbers are engaged in shipbuilding. For London the trade union returns show that 15·5 per cent. of carpenters and joiners were unemployed, as compared with 13·6 a month ago and 14·5 a year ago; the corresponding percentages for plumbers being 15·2, 16·6, and 14·9 respectively. Employment was slack in nearly every large centre, the only towns of any size where carpenters were reported as moderately well employed being Middleton, Stockport, Barnsley, Huddersfield, Swansea, Llanelly, and Dundalk. Masons and plasterers at Dundee were reported as fairly well employed, as also were bricklayers and masons at Cardiff and masons and labourers at Cheltenham. An improvement was reported at Dudley and Wolverhampton, and also at Felixstowe, Halstead, and Bury St. Edmunds.

LAW REPORTS.—*Continued from page* 100.

learned magistrate stated that he so decided feeling himself bound by the judgments given in the High Court in the cases of the London County Council *v.* Wandsworth and Putney Gasworks Company, Charing Cross Electric Corporation *v.* Woodthorpe, and the Whitechapel Board of Works *v.* Crow. The learned magistrate said he did not see anything inconsistent between the powers of the appellant company and the powers of the respondent under the London Building Act. Hence the present appeal.

Mr. Danckwerts, K.C., and Mr. Courthope-Munroe appeared for the appellants; and Mr. Horace Avory, K.C., and Mr. Wimpfheimer for the respondent.

At the conclusion of the arguments of counsel, the Lord Chief Justice, in giving judgment, said that the appellants, the contractors under a contract, dated February 15, 1906, relating to the construction of reservoirs for the Metropolitan Water Board at Honor Oak Hill, objected to an order made by the magistrate to the effect that the District Surveyor, the respondent, was entitled to his fees under the London Building Act. It appeared that on February 13, 1906, the contractors sent a notice to the respondent that they were about to commence the construction of the reservoirs. It had been said during the course of the argument that this notice was sent by a clerk without his having any authority to do so; but inasmuch as no mention of that appeared in the special case, the Court could not take cognisance of it. The only point they had to consider was whether, on the facts as a matter of law, the Surveyor, he having received notice under the London Building Act, and having discharged his duties under that Act, was or was not entitled to his fees? It had been said that the works in question did not fall within the scope of the London Building Act, as the terms of the Board's private Act were wholly inconsistent with the public Act. He was glad that the case had come before them, because, if they were wrong in the judgment they were giving, they could be put right when the case was taken to the Court of Appeal. Having referred to the material provisions of the London Building Act, his lordship said that, as he understood it, the magistrate had found that the work in question was a building or structure within the meaning of sect. 145 of the Act of 1894. For that purpose nothing turned upon the word "building" in contradistinction to the word "structure." Therefore, upon the broad question of whether this was a building or structure, the decisions to which the magistrate referred were, in his opinion, binding on that Court. It was said on behalf of the appellants that if a building did not come within the designation of a domestic building or in the nature of a warehouse, it was outside the Act altogether. He did not agree with that. He was unable to accede to the argument on behalf of the appellants that this was not a building or structure. In those circumstances what they had to decide was whether the mere statutory power to construct a particular work was of itself sufficient to oust the application of the London Building Act. He had not himself the slightest doubt that a portion of the work in question required that there should be some supervision by the District Surveyor. Having referred to the cases bearing on the point, his lordship said he was of opinion that there was nothing in the private Act under which the works were constructed which was inconsistent with the duties of the District Surveyor under the London Building Act. He thought the decision of the learned magistrate was right, and that the appeal should be dismissed with costs.

Justices Bigham and Walton delivered judgment to the same effect.

Leave to appeal was granted.

CASE UNDER THE HOUSING OF THE WORKING CLASSES ACT.

MR. JUSTICE NEVILLE, in the Chancery Division last week, gave judgment in the case of *in re* an arbitration between Jane Harvey (widow) since deceased, and her administratrix and the London County Council, under the Housing of the Working Classes Acts, 1890 to 1903, the case coming before his lordship upon a special case stated by the arbitrator under sect. 19 of the Arbitration Act, 1889.

The short facts of the case were as follows:—By a provisional order made under the Housing of the Working Classes Act, 1890, the London County Council were empowered to carry into execution a scheme relating to certain lands in Clerkenwell and Holborn. Under the scheme the Council were authorised to compulsorily acquire the lands mentioned therein, to pull down the then existing buildings thereon, and to erect new buildings upon the site thereof. The claimant, Jane Harvey, until her death in January, 1908, was the tenant and occupier of a shop and premises known as No. 49, Leather-lane. Although her premises were not included in the scheme, they abutted on the lands and buildings which the Council were authorised to take compulsorily. Mrs. Harvey had carried on at No. 49, Leather-lane, the business of a butcher, and her premises enjoyed an easement of light and air over part of the lands included in the scheme. The Council, having pulled down the houses on the lands acquired, built up new and higher houses thereon, and in so doing interfered (as they admitted) with Mrs. Harvey's easement of light and air. On February 20, 1907, Mrs. Harvey served the Council with a written notice, in which she stated that she was possessed of her house and premises as a yearly tenant, and that she required the Council to pay her, in pursuance of the statutes, 1,350*l.* compensation in respect of the part of the house and premises the Council had taken, and in respect of the easement in question which had been injuriously affected. On May 17, 1907, the Council served the claimant with a counter-notice, in which they offered her the sum of 25*l.* as compensation in respect of all damage sustained or to be sustained by her to which she might be entitled by law. The matter then went to arbitration, when the claimant tendered expert evidence for the purpose of showing that the letting value of her premises for any trade or other purpose including the particular trade carried on by her had been depreciated, and also further evidence to show what the average annual profit of her business was before 1906 for the purpose of proving that her trade had been affected by what the Council had done, and also the goodwill of her business. On behalf of the Council it was objected that the arbitrator had no jurisdiction under the Housing of the Working Classes Act, 1900, to admit the evidence so tendered, as he had no power to award compensation for such personal loss or injury (if any) arising from the interference with the easement, as the provision in that behalf of the Lands Clauses Consolidation Act, 1845, were expressly excluded by sect. 20 of the Act of 1890, and that the Act of 1890 contained no like provision. The arbitrator upheld the objection of the Council, but at the request of the claimant stated the special case. The question for the opinion of the Court was whether the evidence tendered on behalf of the claimant was admissible in the arbitration, and whether in determining the compensation to be paid to the claimant for any loss sustained by reason of the provisions of the Housing of the Working Classes Act, 1890, owing to the partial extinguishment of or interference with the easement of light and air relating to the lands required for the purposes of carrying into effect the scheme, the arbitrator could take into consideration the loss of trade and diminution in value of goodwill.

Mr. Justice Neville held that the evidence tendered by the claimant was not admissible in the arbitration, and that in determining the compensation to be paid by the Council to the claimant for any loss sustained by reason of the provisions of the Housing of the Working Classes Act, 1890, owing to the partial extinguishment of or interference with the easement of light and air relating to the lands required for the purposes of carrying into effect the scheme, the arbitrator could not take into consideration the loss of trade or diminution in value of goodwill. His lordship therefore sent the case back to the arbitrator with that expression of opinion.

SOME RECENT SALES OF PROPERTY: ESTATE EXCHANGE REPORT.

January 11.—By JONES, LANG, & Co.

St. Luke's.—2, New Charles-st. (s.), u.t. 33 yrs., g.r. 6*l.*, y.r. 60*l.* £375

January 12.—By CARTWRIGHT & ROBINSON (in conjunction with PLATTS & PLATTS).

Gerrard's Cross, Bucks.—The remaining portion of the Latchmoor Estate, 18 acres, f. 7,500

By C. LOUND.

Thornton Heath.—The Railway Telegraph p.h., lease for 53 yrs. at 60*l.*, with goodwill and possession; also stabling and shop adjoining, q.r. 45*l.* 8,000

January 14.—By LOCKING, COULSON, & WALKER.

Stoke Newington.—24, Church-rd., u.t. 51¼ yrs., g.r. 6*l.* 6s., e.r. 40*l.* 330

73, Wiesbaden-rd., u.t. 83¾ yrs., g.r. 6*l.* 10s., e.r. 34*l.* 245

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. public-house; o. for offices; s. for shops; ct. for court.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£	s.	d.		
Best Stocks	1	6	0	per 1000	alongside, in river.
Picked Stocks for Facings	2	10	0	,,	delivered
Flettons	1	4	0	,,	at railway depôt.
Best Fareham Red	3	12	0	,,	,, ,,
Best Red Pressed Ruabon Facing	5	0	0	,,	,, ,,
Best Blue Pressed Staffordshire	3	15	0	,,	,, ,,
Do. Bullnose	4	0	0	,,	,, ,,
Best Stourbridge Fire Bricks	3	14	0	,,	,, ,,
GLAZED BRICKS					
Best White and Ivory Glazed Stretchers	10	7	6	,,	,, ,,
Headers	9	17	6	,,	,, ,,
Quoins, Bullnose, and Flats	13	17	6	,,	,, ,,
Double Stretchers	15	17	6	,,	,, ,,
Double Headers	12	17	6	,,	,, ,,
One Side and two Ends	16	17	6	,,	,, ,,
Two Sides and one End	17	17	6	,,	,, ,,
Splays, Chamfered, Squints	15	10	0	,,	,, ,,
Best Dipped Salt Glazed Stretchers	10	7	6	,,	,, ,,
Headers	9	17	6	,,	,, ,,
Quoins, Bullnose, and Flats	13	17	6	,,	,, ,,
Double Stretchers	15	17	6	,,	,, ,,
Double Headers	12	17	6	,,	,, ,,
One Side and two Ends	16	17	6	,,	,, ,,
Two Sides and one End	17	17	6	,,	,, ,,
Splays, Chamfered Squints	15	10	0	,,	,, ,,
Second Quality White and Dipped Salt Glazed	1	5	0	,,	less than best.

	s.	d.		
Thames and Pit Sand	6	6	per yard,	delivered.
Thames Ballast	5	0	,,	,,
Best Portland Cement	28	0	per ton,	,,
Best Ground Blue Lias Lime	19	0	,,	,,

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s.	d.		
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½	per ft. cube.	
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½	,,	,,
PORTLAND STONE (20 ft average)—				
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1	,,	,,
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½	,,	,,

	s.	d.		
Ancester in blocks	1	10	per ft. cube.	deld. rly. depôt.
Beer ,,	1	6	,,	,,
Greenshill ,,	1	10	,,	,,
Darley Dale in blocks	2	4	,,	,,
Red Corsehill ,,	2	2	,,	,,
Closeburn Ree Freestone	2	0	,,	,,
Red Mansfield ,,	2	4	,,	,,

YORK STONE—*Robin Hood Quality.*

	s	d.		
Scappled random blocks	2	10	per ft. cube,	deld. rly. dep.
6 in sawn two sides landings to sizes (under 40 ft. super.)	2	3	per ft. super.	,,
6 in. rubbed two sides ditto. ditto	2	6	,,	,,
3 in sawn two sides slabs (random sizes)	0	11½	per ft. cube.	,,
2 in to 2½ in. sawn one side slabs (random sizes)	0	7½	,,	,,
1½ in. to 2 in. ditto, ditto	0	6	,,	,,
HARD YORK—				
Scappled random blocks	3	0	,,	,,
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	8	per ft. super.	,,
6 in. rubbed two sides ditto	3	0	,,	,,
3 in. sawn two sides slabs (random sizes)	1	2	,,	,,
2 in. self-faced random flags	0	5	,,	,,

SLATES.

In.	In.		£	s.	d.	
20	10	best blue Bangor	13	2	6	per 1000 of 1200 at r.d.
20	12	,, ,,	13	17	6	,, ,,
20	10	first quality ,,	13	0	0	,, ,,
20	12	,, ,,	13	15	0	,, ,,
16	8	,, ,,	7	5	0	,, ,,
22	10	best blue Portmadoc	12	12	6	,, ,,
16	8	,, ,,	6	12	6	,, ,,
20	10	best Eureka unfading green	15	17	6	,, ,,
20	12	,, ,,	18	7	6	,, ,,
18	10	,, ,,	13	5	0	,, ,,
16	8	,, ,,	10	5	0	,, ,,
20	10	permanent green	11	12	6	,, ,,
18	10	,, ,,	9	12	6	,, ,,
16	8	,, ,,	6	12	6	,, ,,

TILES.

	s.	d.	
Best plain red roofing tiles...	42	0	per 1000, at rly depôt.
Hip and Valley tiles ...	3	7	per doz. »
Best Brosel y tiles	50	0	per 1000 »
Do. Ornam ntal tiles	52	6	» »
Hip and Va ley tiles ...	4	0	per doz. »
Best R abon red, brown, or brindled do. (Edwards) ...	57	6	per 1000 »
Do. Ornamental do.....	60	0	» »
Hip tiles	4	0	per doz. »
Valley tiles	3	0	» »
Best Red or Mottled Stafford-shire do (Peakes)	51	9	per 1000 »
Do. Ornamental do.	54	6	» »
Hip tiles.....	4	1	per doz. »
Valley tiles	3	8	» »
Best "Rosemary" brand plain tiles	48	0	per 1000 »
Best Ornamental tiles.....	50	0	» »
Hip tiles	4	0	per doz. »
Valley tiles	3	8	» »
Best "Harrishill" brand plain ti es, sand-faced	50	0	per 1000 »
Do. pressed.....	47	6	» »
Do. Ornamental do.....	50	0	» »
Hip ti es.....	4	0	per doz. »
Valley tiles	3	6	» »
Staffordshire (Hanley) Reds or Brindled tiles	42	6	per 1000 »
Hand-made sand-faced ...	45	0	» »
Hip tiles	4	0	per doz. »
Valley tiles	3	6	» »

WOOD.

Building Wood.	At per standard.					
	£	s.	d.	£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in	13	10	0	15	0	0
Deals: best 3 by 9	13	0	0	14	0	0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11	0	0	12	0	0
Battens: best 2½ by 6 and 3 by 6 ...	0	10	0	less than 7 in. and 8 in.		
Deals: seconds	1	0	0	less than best		
Battens: seconds	0	10	0	,,		
2 in. by 4 in. and 2 in. by 6in.....	9	0	0	10	0	0
2 in. by 4½ in and 2 in. by 5 in....	8	10	0	9	10	0
Foreign Sawn Boards— 1 in. and 1¼ in by 7 in.	0	10	0	more than battens		
¼ in.	1	0	0	,,		
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft.					
	4	10	0	5	0	0
Seconds	4	0	0	4	10	0
Small timber (8 in. to 10 in.).....	3	12	6	3	15	0
Small timber (6 in. to 8 in.)	3	0	0	3	10	0
Swedish balks	2	10	0	3	0	0
Pitch-pine timber (30 ft. average)	4	0	0	4	15	0

Joiners' Wood.	At per standard.					
	£	s.	d.	£	s.	d.
White Sea: first yellow deals, 3 in. by 11 in.	24	0	0	25	0	0
3 in. by 9 in.....	22	0	0	23	0	0
Batten 2½ in. and 3 in. by 7 in.	16	10	0	18	0	0
Second yellow deals 3 in. by 1 in.	18	10	0	20	0	0
" " 3 in. by 9 in.	17	10	0	19	0	0
Battens, 2½ in. and 3 in. by 7 in.	13	10	0	14	10	0
Third yellow deals, 3 in. by 11 in. and 9 in.	13	10	0	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	0	0	12	0	0
Petersburg first yellow deals, 3 in. by 11 in.....	21	0	0	22	10	0
Do. 3 in. by 9 in.	18	0	0	19	10	0
Battens	13	10	0	15	0	0
Petersburg second yellow deals, 3 in. by 11 in.	16	0	0	17	0	0
Do. 3 in. by 9 in.	14	10	0	16	0	0
Battens	11	0	0	12	10	0
Third yellow deals, 3 in. by 11 in.	13	0	0	14	0	0
Do. 3 in. by 9 in.	12	10	0	14	0	0
Battens	10	0	0	11	0	0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14	10	0	15	10	0
" " 3 in. by 9 in.	13	10	0	14	10	0
Battens	11	0	0	12	0	0
Second white deals, 3 in. by 11 in.	13	10	0	14	10	0
" " 3 in. by 9 in.	12	10	0	13	10	0
Battens	10	0	0	11	0	0
Pitch pine: deals	18	0	0	21	0	0
Under 2 in. thick extra	0	10	0	1	0	0
Yellow pine—First, regular sizes	44	0	0	upwards.		
Oddments	32	0	0	,,		
Seconds, regular sizes	33	0	0	,,		
Oddments	28	0	0	,,		
Kauri Pine Planks, per ft. cube...	0	3	6	0	5	0
Danzig and Stettin Oak logs— Large, per ft. cube	0	3	0	0	3	9
Small " "	0	2	6	0	2	6
Wainscot Oak Logs, per ft. cube...	0	5	6	0	6	0
Dry Wainscot Oak, per ft. sup. as inch.....	0	0	8½	0	0	9½
¼ in. do. do	0	0	7	—		
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch ...	0	0	9	0	1	0
Selected, Figury, per ft. super. as inch	0	1	6	0	2	6
Dry Walnut, American, per ft. super, as inch	0	0	10	0	1	0
Teak per load	17	0	0	22	0	0
American Whitewood Planks, per ft. cube	0	4	0	0	5	0
Prepared Flooring, etc.—	Per square.					
1 in. by 7 in. yellow, planed and shot	0	13	6	0	17	0
1 in. by 7 in. yellow, planed and matched	0	14	0	0	18	0
1¼ in. by 7 in. yellow, planed and matched.....	0	16	0	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	0	14	6
1 in. by 7 in. white, planed and matched.....	0	12	6	0	15	0
1¼ in. by 7 in. white, planed and matched.....	0	15	0	0	16	6
¼ in. by 7 in. yellow matched and beaded or V-jointed brds.	0	11	0	0	13	6
1 in. by 7 in. " "	0	14	0	0	18	0
¼ in. by 7 in. white "	0	10	0	0	11	6
1 in. by 7 in. " "	0	12	9	0	15	0

6 in. at 6d. to 9d. per square less than 7in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.					
	£	s.	d.	£	s.	d.
Rolled Steel Joists, ordinary sections	7	0	0	7	10	0
Compound Girders, ordinary sections	9	0	0	10	0	0
Steel Compound Stanchions	11	0	0	2	0	0
Angles, Tees, and Channels, ordinary sections	9	0	0	10	0	0
Flitch Plates	9	0	0	9	10	0
Cast Iron Columns and Stanchions including ordinary patterns.....	7	10	0	8	10	0

METALS.

	Per ton, in London.					
	£	s.	d.	£	s.	d.
Iron—						
Common Bars	8	10	0	9	0	0
Staffordshire Crown Bars, good merchant quality	8	15	0	9	5	
Staffordshire "Marked Bars" ...	10	10	0	—		
Mild Steel Bars	8	15	0	9	5	0
Hoop Iron, basis price	9	5	0	9	10	0
" " Galvanised.....	17	0	0	—		
(*And upwards, according to size and gauge.)						
Sheet Iron Black—						
Ordinary sizes to 20 g.	9	15	0	—		
" " 24 g.	10	15	0	—		
" " 26 g.	12	5	0	—		
Sheet Iron, Galvanized, flat, ordinary quality—						
Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15	0	0	—		
Ordinary sizes to 22 g. and 24 g.	15	10	0	—		
" " 26 g.	1	10	0	—		
Sheet Iron, Galvanized, flat, best quality—						
Ordinary sizes to 20 g.	18	0	0	—		
" " 22 g. and 4 g.	18	10	0	—		
" " 26 g.	20	0	0	—		
Galvanised Corrugated Sheets—						
Ordinary sizes, 6 ft. to 8 ft. 20 g.	14	10	0	—		
" " 22 g. and 24 g.	14	15	0	—		
" " 26 g.	16	5	0	—		
Best Soft Steel Sheets. 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	12	0	0	—		
Best Soft Steel Sheets, 22 g. & 24 g.	13	0	0	—		
" " " 26 g.....	15	0	0	—		
Cut Nails, 3 in. to 6 in.....	10	10	0	11	0	0
(Under 3 in., usual trade extras.)						

Lead, &c.	Per ton, in London.					
	£	s.	d.	£	s.	d
Lead—Sheet, English, 3lb. and up.	16	12	6	—		
Pipe in coils	17	2	6	—		
Soil pipe.....	19	2	6	—		
Compo pipe	20	2	6	—		
Zinc—Sheet—						
Vielle Montagne .....ton	26	10	0	—		
Silesian	26	5	0	—		
Copper—						
Strong sheet .....per lb.	0	1	0	—		
Thin " ..... "	0	1	1	—		
Copper nails ..... "	0	0	10	—		
Copper wire ..... "	0	0	10	—		
Brass—						
Strong Sheet..... "	0	0	11	—		
Thin ..... "	0	1	0	—		
Tin—English Ingots..... "	0	1	5	—		
Solder—Plumbers ..... "	0	0	7	—		
Tinmans..... "	0	0	9½	—		
Blowpipe ..... "	0	1	0	—		

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds.....	2½d. per ft. delivered.
" fourths	1½d. " "
21 oz. thirds	3d. " "
" fourths	2½d. " "
26 oz. thirds	4d. " "
" fourths	3d. " "
32 oz. thirds	4½d " "
" fourths	4½d. " "
Fluted Sheet, 15 oz	3½d. " "
" 21 oz.....	4¼d. " "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

⅛ Hartley's	2½d. per ft. delivered.
3/16 "	2⅝d. " "
¼ "	2⅞d. " "
Figured, Oxford Rolled and "Oceanic" Glass, white	3½d. " "
" " tinted ...	5d. " "
Other Glass—	
Arctic" Glass, white	3½d. " "
" " tinted	5d. " "
" " Ruby and opalescents	1s. " "

Oils, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	1	11
" " ,, in barrels	"	0	2	0
" " ,, in drums.....	"	0	2	3
Boiled ,, ,, in barrels.....	"	0	2	3
" " ,, in drums.....	"	0	2	6
Turpentine in Barrels	"	0	2	7
" in drums	"	0	2	9
Genuine Ground English White Lead	per ton	21	0	0
Red Lead, Dry	"	20	0	0
Best Linseed Oil Putty	per cwt.	0	7	0
Stockholm Tar	per barrel	1	12	0

Varnishes, &c.	Per gallon.		
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak.....	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak.....	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	6
Fine Elastic Carriage	0	12	0
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Mapel	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flating Varnish.....	0	18	0
White Pale Enamel	1	4	0
Extra Pale Paper.....	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain.....	0	9	0
Brunswick Black.....	0	8	0
Berlin Black	0	16	0
Knotting	0	10	9
French and Brush Polish.....	0	10	6

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday.* [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcement of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted.* † Denotes *provisionally accepted.*

BARNSLEY.—For new sewage works (Contract No. 7), for the Town Council. Mr. J. Henry Taylor, M.Inst.C.E., Borough Surveyor, Engineer for Works, Manor House Offices, Barnsley:—

W. Crossland	£5,206 12 9
C. Castle & Co.....	5,091 13 10
H. M. Noel	4,967 5 3
Firth & Co.	4,937 17 6
G. W. Deakin	4,256 1 4
J. H. Macdonald.....	3,907 0 0
C. Chamberlain	3,534 3 3
B. Firth	3,509 18 2
P. D. Hayes & Sons	3,429 5 9
Coop & Flannery.....	3,395 11 1
A. Graham & Sons	3,394 0 0
H. Smith	3,351 2 2
Kaye Bros.	3,258 9 5
H. E. Buckley, 107, Swan Arcade, Bradford*.....	3,184 14 6

BARNSLEY.—For new sewage works (Contract No. 6), for the Town Council. Mr. J. H. Taylor, Borough Surveyor, Manor House Offices, Barnsley:—

Birtley Iron Co.	£2,619 19 1
D. G. Stewart & Co.	2,487 18 6
Cochrane & Co., Ltd.	2,259 11 0
Cochrane & Co. (Woodside), Ltd...	2,061 0 10
Clay Cross Iron Co.....	2,013 8 11
J. Cakes & Co.....	1,998 5 2
Sheepbridge Coal and Iron Co.	1,989 5 1
G. B. Jackson & Son	1,929 16 7
Holwell Iron Co.	1,927 11 3
Staveley Coal and Iron Co., Barrow Hill, near Chesterfield*	1,888 5 2

BARRY AND CADOXTON.—For laying out parks for the Urban District Council of Barry. Mr J. C. Pardoe, Surveyor, Council Offices, Barry:—

J. Stapleton, Harbour-road, Barry*	£1,286 16 0½
S. J. Martyn, Oxford-street, Barry*	629 18 10

BIRMINGHAM.—For additions and alterations to Messrs. S. C. Larkins & Son's premises, Livery-street and Barwick-street. Messrs. "W. H. Ward," architects, 30, Paradise-street, Birmingham:—

1st Contract.			
J. Barnsley & Sons	£458 0	W. George & Co...	£335 0
G. Webb & Son ..	427 0	W. Sapcote & Sons*	334 0
G. Robinson	397 0		
2nd Contract.			
J. Barnsley & Sons	£433 15	W. George & Co...	£315 0
G. Webb & Son ..	389 0	W. Sapcote & Sons*	310 0
G. Robinson	358 10		
3rd Contract.			
J. Barnsley & Sons	£405 0	W. Sapcote & Sons*	£302 0
G. Webb & Son ..	399 0		
G. Robinson	364 0	W. George & Co...	290 0
4th Contract.			
G. Webb & Son ..	£345 0	W. George & Co...	£265 0
J. Barnsley & Sons	343 0	W. Sapcote & Sons*	263 0
G. Robinson	325 0		

BRIDLINGTON.—For heating Burlington Schools with hot water (low pressure), for the Education Committee. Mr. J. Earnshaw, architect and surveyor, Carlton House, Bridlington:—

Unity Wood & Iron Co.	£480 0 0	Leeds Marble Works	£386 12 0
King & Co.....	427 0 0	F. & T. Everingham	382 12 3
Haden & Co. ..	410 0 0	J. Woodhead..	375 0 0
Bailey & Sons	410 0 0	W. Nettleship, Bridlington*.	365 0 0
Atkinson	399 15 0	Dinning & Cooke	272 0 0
T. Green & Son	398 0 0		
Braithwaite ..	395 0 0		
Young & Peck	393 0 0		

BRIDLINGTON.—For erecting Burlington Schools and caretaker's residence, for the Education Committee. Mr. J. Earnshaw, architect and surveyor, Carlton House, Bridlington:—

W. H. Dews.....	£9,679 17 6
T. Spink	9,579 5 0
W. Airey & Son	9,550 0 0
Quibell, Son, & Greenwood, Ltd...	9,500 0 0
C. Wilson	9,149 4 0
Musk & Son.....	8,995 0 0
Smallwood & Shaw.....	8,919 1 3
W. A. Storr	8,873 4 4
F. W. Martindale.....	8,870 0 0
Sampson & Siddall.....	8,768 11 7
C. Gant.....	8,741 19 7
F. Postell.....	8,738 19 0
T. A. Moore, Bridlington*.....	8,615 10 0

CLAYGATE.—For roadmaking, Station Parade, for the Urban District Council of Esher and the Dittons. Mr. Horace C. Fread, Engineer and Surveyor to the Council:—

	Patent Stone Paths.	Asphalt Paths.
Sheppard & Son	£636	.... £589
Kavanagh & Co.	507	 471
Free & Son	491	 429
Wheeler & Co., Southwark, S.E.*..	437	 408

DUNMOW (Essex).—For the excavations, concrete foundations, and sundry walls, etc., in connexion with corrugated-iron buildings. Also for the iron buildings of a bacon factory, to be erected at Dunmow, for the Dunmow Flitch Bacon Co., Ltd. Messrs. William Douglas & Sons, engineers, Ltd.:—

Nicholds & Reynolds, King's-court, Broadway, Westminster, S.W... £2,996 0 0

[Buildings are to be of steel framing, and hollow concrete block walls.]

ESHER.—For making-up, etc., Hillbrow-road, for the Urban District Council of Esher and the Dittons. Mr. H. C. Fread, Engineer and Surveyor to the Council:—

H. N. Blaker	£541 0 0
Free & Son	520 0 0
Kavanagh & Co.	487 0 0
Parry & Co.	480 0 0
J. Mowlem & Co.	468 0 0
Sheppard & Son, Teddington*	404 12 5
McLean & Co.	398 2 10

FINCHLEY.—For private street works and street improvements, for the Urban District Council:—

*C. T. Gibbons, Leytonstone—£2,041 12s. 2d., Fallow-court-avenue; £1,078 10s. 3d., Eton-avenue; £940 12s., Woodside-grove; £390 12s. 6d., Chambers-gardens.

*T. Adams, Wood Green, N.—£2,130 0s. 2d., Church-crescent; £872 11s., Victoria-avenue.

*Free & Sons, Tottenham—£920 3s. 9d., Park-crescent; £3,317 5s. 8d., Street Improvements—Bow-lane, Granville-road, and Oak-lane.

GLASTONBURY.—For erecting an annexe to the engine-house on Wellhouse Reservoir, for the Water-works Undertaking Committee. Mr. G. Alves, Borough Surveyor, Glastonbury:—

Gleed Bros.	£288 16 2	R. J. Stead, Glas-tonbury*	£251 10 0
D. R. Dunthorn	267 10 0		
Wright & Son	263 2 0		

HOLMFIRTH.—For the construction of a proposed road (620 yds. in length, together with 264 yds. fence walling, brick culvert, retaining walls, etc.) at Holmfirth, from Green-lane Mills to Dunford-road, for Messrs. J. Watkinson & Sons, Ltd. Messrs. Brook, Dransfield, & Dyson, surveyors, 12-15, Estate-buildings, Huddersfield:—

England	£1,595 0 0
Jowitt	1,336 19 0
Marsden & Sons	1,307 0 0
R. Turner	1,296 15 8
A. Graham & Sons	1,260 0 0
M. S. Crowther & Sons	1,204 0 0
A. Graham & Co.	1,199 0 0
J. W. Boothroyd	1,145 0 0
Garside & Whiteley	1,120 0 0
J. Wempenny & Co.	1,071 0 0
J. Turner	1,040 0 0
W. Waring & Sons, Huddersfield*	1,018 0 0

KENDAL.—For making-up of Hutchinson's Yard, Stricklandgate, for the Corporation. Mr. F. W. Oxberry, Borough Engineer and Surveyor, Town Hall, Kendal. Quantities by Engineer:—

R. Woodburn	£125 13 9	T. & W. Dirkin, Kendal*	£100 17 5
W. Carradice	101 17 8		

[Borough Surveyor's estimate, £104.]

KENSINGTON.—For jobbing paving work for two years, for the Borough Council:—
E. Rogers & Co., at 7 per cent. below schedule prices.

LEWISHAM.—For iron and steel work and galvanised-iron roofing to cartsheds at the Council's Depôt, Old-road, Lee, for the Borough Council:—
Walker Bros., Ltd., Victoria Works, Walsall.... £59

LONDON.—For the execution of certain work in connexion with the provision of additional lavatory accommodation at their workhouse in Prince's-road, Kennington, S.E., for Lambeth Guardians:—

		Time to Execute Work. Weeks.
A. Newman	£147 0 0	4
M. Bagshaw	145 10 0	3
A. Crick	136 14 8	3
Shanks & Co., Ltd.	131 8 7	3
G. Bland	130 0 0	5
E. Wall	124 12 0	4
E. A. Hough	123 0 0	5
H. Bragg & Sons, Ltd.	122 10 0	4
Newman & Manning	120 11 0	4
G. Jennings, Ltd.	114 16 10	4 to 5
S. Knight	110 15 0	6
J. A. Renwick	108 0 0	4
Doulton & Co., Ltd.	104 11 0	7
Newell & Lusty	100 0 0	8
A. G. Chamberlain	98 10 0	4
A. W. Inns, 36, Camomile-street, E.C.*	86 0 0	3

LONDON.—For granolithic paving, tarpaving, and roadmaking at the infirmary, Lower-road, Rotherhithe, S.E., for Bermondsey Guardians. Mr. A. H. Newman, F.R.I.B.A.:—
S. Hobman & Co., Hill-street, Peckham £447 0 0

LOWESTOFT.—For new secondary school for 300, for the Education Committee. Messrs. Brown & Burgess, architects, Ipswich. Quantities by architects:—
Charles Roper, Ipswich* £9,143 0 0

NEW SARUM.—For erecting a workshop, stores, etc., in Friary-lane, for the Urban District Council. Mr. W. J. Goodwin, A.M.Inst.C.E., City Engineer and Surveyor, Municipal Offices, Salisbury:—

Wort & Way	£769 0 0
Day Bros.	756 0 0
Collins & Son	751 18 8
E. Preece	750 0 0
H. Tryhorn	736 10 0
Smith & Bundy	725 0 0
Roles & Son	719 15 0
Harris Bros.	710 0 0
Billett & Musselwhite, Salisbury*	694 19 6

NUNEATON.—For addition to Council Offices and construction of timber footbridge in Riversley Park, for the Corporation. Mr. F. C. Cook, Borough Surveyor, Nuneaton:—

Additions to Council Offices.

A. A. Cattell	£387 0	A. Bedingham, Nuneaton*	£328 0
Kelley & Son	369 4		
T. Smith	331 0		

Footbridge in Riversley Park.

Kelley & Son	£103 15 7	A. Bedingham, Nuneaton*	£96 0 0
T. Smith	102 0 0		

PONTNEWYDD.—For sewer works, from Pontrhydyrnn to Five Locks, for Llanfrechfa Upper Urban District Council. Mr. G. Jones, Surveyor, Richmond-road, Pontnewydd:—

J. N Morgan	£125 0	H. Smith	£99 15
Poulton & Whiting	109 10	G. Presser	97 0
G. Edwards	102 10	R. Partridge, Cwm-bran, Mon.*	83 4
R. Macnab	101 0		

ST. ALBAN'S.—For sewer works, Fleetville, for the Rural District Council. Mr. H. F. Mence, Surveyor, Town Hall-chambers, St. Albans:—
E. E. Cousins, "Cadoxton," St. Albans* £226 15 8

SOUTHAMPTON.—For hot-water heating plant at the Central Fire Brigade Station, St. Mary's-road, for the Corporation. Mr. J. A. Crowther, Borough Engineer:—

Brightside Foundry and Engineering Co., Ltd.	£85 0 0	W. Dibben	£72 0 0
Dowdall & Son	81 16 6	Ashton & Shepstone	68 17 0
Lankester & Son, Ltd.	81 7 6	Shalders & Davis, Southampton*	61 10 0

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